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International Assembly — St. Louis Auditorium, St. Louis, Mo., October 14 to 17 inclusive, 1947, 32nd year.

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The Treatment of Brain Injuries

ALFRED W. ADSON*

MAYO FOUNDATION, GRADUATE SCHOOL UNIVERSITY OF MINNESOTA, ROCHESTER, MINN.

CRANIOCEREBRAL injuries have become so numerous that no physician can escape their treatment. A review of the literature may convey that there is considerable confusion about the accepted methods of treatment. However, on careful analysis of the different reports one learns that all writers on cranial injuries agree that an injured patient should be promptly treated for shock and for intracranial hemorrhages and that débridement should be employed for scalp, skull, and cerebral injuries. Authors are divided concerning the indications for spinal drainage, which suggests that the extreme views of those who advocate never doing, or always doing, a spinal puncture following a craniocerebral injury should be modified. There are times when one would like to know whether blood is present in the spinal fluid, and occasionally spinal drainage supplements dehydration in controlling cerebral edema.

The management of increased intracranial pressure resulting from a cerebral injury is not always easy to outline, since hemorrhage as well as edema may produce the increased pressure. Extradural, subdural and intracerebral hemorrhages require surgical treatment. Cerebral edema can be controlled by nonoperative measures as well as by a cranial decompression. Hence, we find that two schools of thought exist. The one advocates operative measures,[8] the other nonoperative treatment.[9] Those who believe in the operative treatment for increased intracranial pressure argue that intracranial hemorrhages will often be overlooked unless craniotomy is performed. Those who advocate the nonoperative treatment argue that unless the hemorrhage is massive, surgical intervention may be avoided.

The nonoperative treatment consists of three procedures. The first is active dehydration accomplished by saline cathartics, intravenous administration of hypertonic solutions and limitation of fluids. The second consists of diagnostic spinal punctures and repeated spinal drainages. The third is frequently referred to as the "do nothing" treatment, since neither dehydration, spinal drainage nor temporal decompression is employed. Those advocating this treatment carry out the careful management of traumatic shock, employ surgical procedures for the control of hemorrhages, elevation of fragments and thorough débridement of compound comminuted fractures and administer barbiturates to quiet the patient, but give no fluids until the second or third day, thus allowing the patient to dehydrate himself.

There are distinct merits and limitations in all the individual procedures. Undoubtedly an occasional cerebral herniation may follow excessive spinal drainage.[15] Dehydration may be

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carried to excess, especially if the patient is in deep coma and is unable to take fluids by mouth. The "do nothing" treatment may result in death if there is a high degree of increased intracranial pressure. The temporal or suboccipital decompression may also fail to give sufficient relief to control the increased intracranial pressure. I have observed, even though my experience is not as extensive as that of Munro, Mock, Fay, Dandy, Coleman, Rand, and others[7] who have emergency services in large city hospitals, that a combination of two or more of these various procedures often proves more effective in treating increased intracranial pressure than rigid adherence to one type of treatment. It is extremely important to recognize the extent of the injury in order to select the most suitable treatment.

In outlining treatment for head injuries I find it convenient to discuss three phases: emergency treatment, convalescent treatment and treatment of posttraumatic sequelae.

EMERGENCY TREATMENT

THE EMERGENCY treatment[1] consists of transferring the injured individual to the hospital, recognizing the extent of the injury, treating traumatic and cerebral shock, controlling hemorrhages, operative procedures on compound fractures and the management of increased intracranial pressure when present.

When called to attend a patient who has met with an accident, one should always be on the alert to evaluate the whole situation, the nature of the accident, the force of the impact and the position of the patient at the time of the accident and following the accident, because internal injuries, fractures of the spinal column or fracture of bones other than those of the skull may be more serious than the head injury. It is not always easy to determine the extent of the head injury at the place of the accident, but one should observe the mental status, whether or not the patient has been temporarily unconscious, is confused or is stuporous and in deep coma.

It is needless to emphasize the fact that obvious hemorrhages need to be controlled and that the patient should be transferred without increasing the trauma already produced by fractured bones. Occasionally, the cerebral trauma appears to be slight and the patient has regained consciousness and sees no reason for being hospitalized. If the attending physician permits the patient to return to his home rather than to a hospital, the relatives or friends should be instructed concerning the dangers of hemorrhages and the symptoms that may develop. In most instances the rational advice is to urge the patient, even though the injury may appear slight, to be hospitalized for forty-eight hours.

Concussion—Concussion is the simplest form of craniocerebral injury. It is a common term applied to head injuries and frequently employed by the laity. It should be restricted to those cases in which a blow on the head has produced some degree of unconsciousness, but in which the patient on recovery presents no residual symptoms. The exact pathologic basis of this phenomenon is unknown; concussion is believed by some to be due to a molecular disintegration resulting from anatomic changes and circulatory damage. Others hold that there is a disturbance in the ions and electrons. Changes in pressure on subcortical vessels from

Fig. 1. Die and counter die method of forming plate. From Baker, G. S.: Cranioplasty with tantalum plate: a new method of forming the plate prior to operation. Proc. Staff Meet., Mayo Clin. 21:177-182 (May 1) 1946.

fluid waves as the result of the impact may also be an explanation for the temporary unconsciousness. According to Munro, a violent histologic insult to the brain must be predicated to produce such changes.

CEREBRAL COMPRESSION differs from concussion in that the state of unconsciousness is prolonged and is due to increased intracranial pressure of cerebral laceration. The disturbance of consciousness may vary from a short period of semiconsciousness, a dazed or confused state, to one of deep coma. Many of the patients are restless and delirious. The majority regain consciousness within hours to three or four days, while in others the loss of consciousness may continue for several weeks.

Treatment of shock—Though it may be difficult to distinguish between the symptoms that are due to general shock and those due to cerebral shock, the emergency treatments are very similar. Heat should be applied in the form of warm blankets; skeletal fractures should be temporarily supported; stimulants such as caffeine and ephedrine should be administered. In the event of severe hemorrhages, the foot of the bed may be raised and a transfusion administered. As soon as the blood pressure returns to normal and the body becomes warm, examinations should be conducted.

A general examination to determine the extent of bodily injuries other than that to the head should be conducted in conjunction with a neurologic examination. The neurologic examination may be rather unsatisfactory in a comatose or non-cooperative patient, but it is possible to determine whether or not one or both pupils are dilated or whether a squint is present. It is also possible to determine whether or not a flaccid or a rigid paralysis exists and whether the reflexes are normal, lost or exaggerated, or if localized ecchymosis or hemorrhage from the ear or from the nasal orifices is present. The appearance of cerebrospinal fluid from the ear or nasal passages or from the compound fracture is significant. Roentgenographic examinations of the head in the anteroposterior and lateral views and roentgenographic examinations of suspected fractures of other bones are of inestimable value.

When immediate surgical intervention is indicated, it may become necessary on admission to the hospital to take the patient to the operating room, where reparative procedures

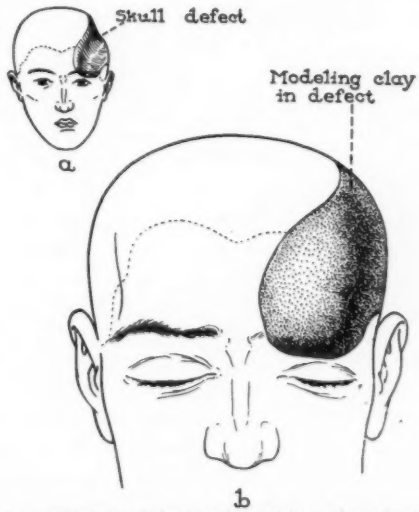

Fig. 2. Filling-in defect with modeling clay; first stage of method. From Baker, G. S.: Cranioplasty with tantalum plate: a new method of forming the plate prior to operation. Proc. Staff Meet., Mayo Clin. 21:177-182 (May 1) 1946.

can be employed simultaneously with the treatment of shock and other bodily injuries. In the event that the patient is delirious a sedative is necessary, but one should never administer morphine since it is a respiratory depressant. The barbiturates, sodium iso-amylethyl barbituric acid and pentobarbital sodium, are the most effective. If it becomes necessary to anesthetize the patient during the emergency surgical procedures, a general anesthetic may be necessary, for a delirious patient rarely cooperates with the surgeon even though the latter anesthetizes the scalp with a local anesthetic. The anesthetic that has proved of greatest value is sodium ethyl thiobarbiturate administered intravenously.

IN CLEANSING and repairing a scalp, skull and brain wound, care should be taken to shave hair well beyond the wound, remove all foreign material, trim the traumatized edges, remove spicules of bone and prolapsed brain, and aspirate intracerebral clots. An aqueous solution of an organic mercurial germicide is used for cleansing compound comminuted fractures of the skull with the accompanying lacerations of the scalp and brain. The dura should be closed with interrupted sutures of catgut, and the scalp with interrupted dermal sutures of either silk or silkworm gut. Occasionally it is necessary to approximate the edges of the galea with interrupted sutures of catgut. I prefer not to use silk sutures below the scalp in a traumatic wound for fear that an infection may be present, in which case the silk sutures would have a tendency to continue the infection. Small strips of rubber tubing may be used for drainage. Hemostasis can be effected by ligatures of catgut, by silver clips or by the electrocoagulation current. In the event that there is a depressed fracture or a comminuted fracture which is not compound, the fragments can be elevated and tied in place with silver wire forming a mosaic pattern at the site of injury. These fragments are held in place by threading interrupted loops of silver wire through gimlet hole openings made in the fragments and in the skull along the margin of the fracture.

On the completion of the emergency surgical treatment of the head injury and other bodily injuries, the patient is returned to his bed, where the treatment for shock is continued. The administration of antitetanic and antigas serum is indicated when abrasions, cuts or lacerated wounds have been sustained. It should not be given until the patient has recovered from general shock. Oftentimes it is wise to delay the injection of these serums until the day following the injury.

Fractures—Fractures of the skull may be divided into three groups: linear, depressed and comminuted, all of which may or may not be compound.

The linear fractures most frequently involve the base of the skull and fairly frequently extend into the nasal sinuses or across the temporal bone. The hemorrhages accompanying them are not serious unless the tears in the meninges extend across meningeal arteries or the cavernous sinus. Linear fractures across the temporal bone frequently result in tearing of the middle meningeal artery with the development of an extradural hemorrhage. Linear fractures extending across the longitudinal or lateral sinuses may have an accompanying tear in the venous sinuses with the development of both an extradural and a subdural hemorrhage. The basal fractures which result in tearing of the meninges will manifest themselves by localized ecchymosis and the escape of blood-tinged cerebrospinal fluid from the nose or the ear. Accumulations of blood will produce signs of increased intracranial pressure.

Injuries to the oculomotor nerves will be evidenced by oculomotor palsies; injuries of the petrous portion of the temporal bone are usually associated with facial paralysis and deafness. The symptoms resulting from extradural hemorrhages are delayed, and it is fairly common for a patient to regain consciousness for several hours following the injury and then to lapse again into a state of coma. Extradural hemorrhages also produce a unilateral dilatation of the pupil and a contralateral spastic hemiplegia. Therefore, a patient should be kept under close observation for the first forty-eight hours when-

ever a fracture is situated over a meningeal artery or a large sinus. Accumulation of blood in the posterior fossa or trauma to the cerebellum produces nystagmus and cerebellar ataxia and occasional paralysis of the sixth nerve. Fractures of the floor of the posterior fossa may result in tears of the ninth, tenth, eleventh and twelfth cranial nerves.

DEPRESSED fractures vary in extent and location. Small depressed fractures over the silent regions of the brain may be of no serious consequence and need no surgical treatment just as simple linear fractures need no special treatment. If, however, the depressed fracture tears an important vessel the blood clot will need to be evacuated and the hemorrhage controlled. If a depressed fracture occurs in the frontal bone an elevation is indicated for cosmetic reasons. The elevation of such a fracture may be postponed until the patient has recovered from the immediate effects of his head injury. Depressed fractures over the motor, speech or visual centers should be elevated as soon as the traumatic shock has been treated.

Comminuted fractures may or may not be depressed. Whenever the physical examination or the roentgenographic examination reveals spicules driven into the brain they should be withdrawn and the fragments should be elevated, replaced and held in position by silver wire ties if the wound is not compound. Most depressed fractures are comminuted; occasionally it is possible, after making a single trephine opening, to introduce an elevator under the depression and restore its former contour. In the event that fragments of bone are removed, plastic repair may be performed at some later date. Occasionally if the bony defect is small, no repair is necessary unless the fracture has occurred in the frontal bone, when, for cosmetic reasons, a repair is indicated.

Control of hemorrhages—Extradural arterial hemorrhages are controlled through a decompression type of craniotomy or through a small flap craniotomy by the application of a silver clip, by ligation of the vessel with silk or by the electrocoagulating needle. Extradural clots are evacuated and the pockets are cleansed with saline solution. If a marked cerebral depression has resulted, a small tube drain should be left in place for twenty-four hours. Tears in the large sinuses should be explored at the location of the fracture across the sinus. This is done by trephining over the location and enlarging it

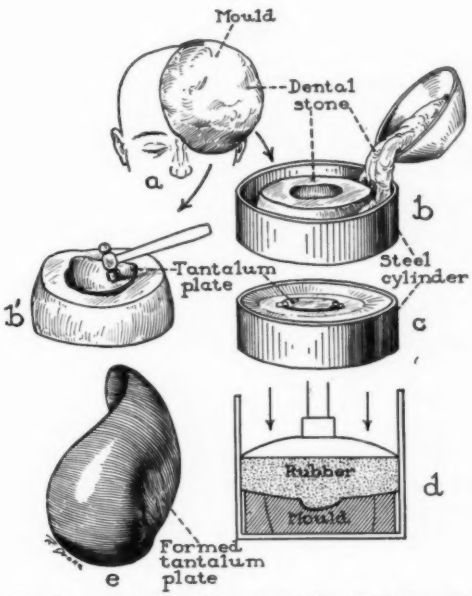

Fig. 3*a* to *e*. Method of forming mold and the plate. From Baker, G. S.: Cranioplasty with tantalum plate: a new method of forming the plate prior to operation. Proc. Staff Meet., Mayo Clin. 21:177-182 (May 1) 1946.

sufficiently to expose the tear. Rents in the sinus are repaired by the application of a pledget of muscle which is held in place by a wick of gauze for seventy-two hours. The dura, lateral to the sinus, should be incised in order to determine whether or not the tear in the sinus has resulted in an extravasation of venous blood into the subdural spaces. Such lacerations are also repaired by pledgets of muscle. The subdural hemorrhages are removed by repeated aspirations and saline washings. The dura is closed with either catgut or silk, depending on whether or not the wound is compound.

Occasionally subdural hemorrhages[6] result

from tears in small vessels extending from the dura to the arachnoid. These tears result in slow extravasations of blood with the development of symptoms of intracranial pressure or focal signs of compression. These injuries may not be accompanied by skull injury. The suspicion of a subdural hematoma justifies burr-hole openings and incisions in the dura to clarify the diagnosis. Occasionally a patient will appear to recover from the symptoms of an acute head injury, but fail to regain his normal health. Drowsiness may persist; headaches may continue; focal signs may fail to disappear weeks or even months after a head injury. When this occurs one must consider the possibility of a subdural hematoma. A diagnostic encephalogram may reveal distorted contours in the ventricular system and a failure in the equal distribution of air in the subarachnoid spaces. Since the subdural hemorrhage is free to travel between the dura and the arachnoid on both sides of the brain, it is wise to trephine on both sides to avoid overlooking the subdural hematoma on the contralateral side of the injury. Subdural hematomas, unless they have been of long duration, can be aspirated and the pockets washed with saline solution by the employment of a small catheter which is attached to a syringe. If the hemorrhage has been extensive it may be necessary to make two or three trephine openings and leave a No. 18 catheter as a through-and-through drainage to prevent any subsequent refilling of the cavities. The brain will eventually expand by the refilling of the ventricles and the subarachnoid spaces. This may be hastened by forcing the amount of liquids taken by the patient.

Hemorrhages of the base from tears in the dura are not easy to cope with. If one is in doubt, a temporal exploratory decompression is indicated. With an illuminated retractor it is possible to elevate a cerebral lobe and control the meningeal bleeding with an electrocoagulating needle. Hemorrhages from a cerebral vessel can be controlled in a similar manner or with the aid of a silver clip. Usually the hemorrhages are not severe unless a branch of the meningeal artery is torn or the cavernous sinus has been injured. The latter injury, when it occurs, results in such a rapid extravasation of blood that the patient frequently succumbs before surgical treatment can be instituted. If one is fortunate enough to localize the hemorrhage from a vein of the cavernous sinus it is controlled with a pledget of muscle by a technic similar to that employed when injuries occur to the superior longitudinal and lateral sinuses.

As a rule, it is not wise to attempt a repair of the meninges when an escape of cerebrospinal fluid occurs from the nasal sinuses or the middle ear. One should not perform spinal punctures or spinal drainage for fear of reversing the current and drawing nasal discharges into the meningeal spaces. The judicious use of sulfonamides serves as a prophylactic measure in minimizing the development of meningitis. The introduction of sterile cotton pledgets into the external ear serves as another protective measure. Usually the cerebrospinal fluid ceases to drip within a week or ten days. Should a cerebrospinal fistula develop, an intracranial repair of the meninges by suture or by the application of a muscle pledget should not be undertaken within less than eight to twelve weeks following the head injury.

Tears in the meninges, especially in the region of the ethmoid and frontal sinus, result not only in cerebrospinal leaks, but occasionally in pneumo-encephalos. These can be visualized by roentgenographic examination. Most of them disappear spontaneously, but occasionally an air cavity may exist for weeks. If it is of any serious size a trephine opening may be employed for the introduction of a brain cannula and the withdrawal of the air in the cavity.

Hygromas—Hygromas may simulate subdural hematomas in symptomatology since a tear in the arachnoid which usually occurs along the sylvian fissure permits cerebrospinal fluid to enter the space between the dura and the arachnoid where it becomes locked. These are corrected by performing a small decompression, opening the dura and allowing the fluid to escape. Again a small tube drain is left in place for several days until the ventricles

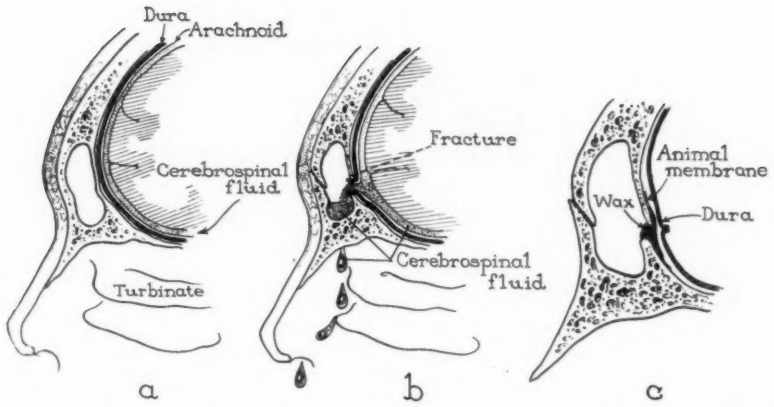

Fig. 4*a*. Normal relationships of the brain, meninges and skull in the frontal region; *b*, craniosinus fistula with leakage of cerebrospinal fluid into the frontal sinus and thence into the nose; *c*, plastic closure of the meninges and occlusion of the bony defect with wax. From Adson, A. W.: Cerebrospinal rhinorrhea: surgical repair of craniosinus fistula. Ann. Surg. 114:697-705 (Oct.) 1941.

expand and force the brain against the dura and the cranial wall.

Cerebral trauma—Cerebral trauma varies from a localized bruise with punctate hemorrhages to extensive lacerations of the brain. The *contrecoup* injuries may be as great as those at the point of impact. The skull injury is rarely an indication of the extent of the cerebral injury. The degree of coma, the state of the pulse, respirations, blood pressure, and the evidence of neurologic signs furnish the only accurate evaluation of the cerebral injury. Even then it may be difficult to arrive at an accurate opinion, since a rapidly developing cerebral edema or intracranial hemorrhage may exaggerate the symptoms. If symptoms of a localized condition exist, an exploratory decompression may be required to eliminate the possibility of an intracranial hemorrhage. The symptoms resulting from cerebral edema are more or less diffuse; restlessness or coma may persist for hours or days without evidence of localized paralysis.

Intracranial pressure—Increased intracranial pressure usually follows a craniocerebral injury.[14, 16] It results from cerebral edema and intracranial hemorrhages. With the absence of localizing signs one is justified in performing a spinal puncture. The reading of the spinal pressure indicates the degree of intracranial pressure. Spinal drainage may prove effective in controlling the intracranial pressure. On the other hand, if the spinal pressure is not particularly increased, the pulse is not slowed and the respirations are not stertorous, one need not be greatly alarmed and the so-called do-nothing treatment may be the advisable course to follow.

However, if signs of increasing intracranial pressure appear, the course of dehydration should be followed. It consists of employing limitation of fluids to 1,000 cc. for the first twenty-four hours and the administration of magnesium sulfate by enema, dissolving 2 ounces (62 gm.) of salts in 4 fluid ounces (118 cc.) of water, to be followed by intravenous administration of 50 cc. of 50 per cent solution of glucose or sucrose. Unfortunately the effects of intravenous administration last for only four to six hours. A repetition of the intravenous administration may be required during the first forty-eight hours. After the first twenty-four hours, I prefer to administer glucose in 20 per cent solution in quantities of 500 cc. repeated twice or three times daily.

THE DEHYDRATION measures are supplemented by repeated spinal drainage if the two procedures give evidence of controlling the intracranial pressure, but it should be remembered that if the initial treatment of the cerebral edema by dehydration and spinal drainage is ineffective a large temporal decompression, or even a suboccipital decompression, should be resorted to. Though some surgeons prefer the decompression method for the control of cerebral edema, I prefer to give the dehydration and spinal drainage as a therapeutic test before resorting to surgical intervention, and I have also found that the dehydration may even supplement the effects of a decompression.

If the patient has not regained consciousness by the third day, one should be rather cautious about extending the dehydration too far, since the patient automatically dehydrates himself by the loss of fluid through respiration, perspiration and excretion. As a rule, we introduce a Rehfuss tube into the stomach by way of the nasal passages in order to administer 2,000 cc. of water and nourishment, and saline cathartics if we think it necessary to continue a moderate degree of dehydration. From the third day until the patient becomes conscious, fluid and nourishment are administered through this tube in small quantities at hourly intervals.

The problem of controlling restlessness is very perplexing at times. I dislike the use of morphine, since it is a respiratory depressant. Codeine is rarely effective; the barbiturates are the most useful. Phenobarbital in rather large doses, 1½ grains (0.1 gm.) every six hours, is usually sufficient. In the more violent cases, sodium iso-amylethyl barbiturate or pentobarbital sodium is required. I dislike to restrain a patient and believe that it is less injurious to the patient to be narcotized by the more potent barbiturates than to be forcibly restrained by wrist and leg bands. In a few instances it has been necessary to administer sodium ethyl thiobarbiturate intravenously as an initial sedative.

CONVALESCENT TREATMENT

On the return of consciousness the physician too often concludes that the patient has recovered from his cerebral injury, but it should be remembered that if the patient is dismissed from hospital care before he has thoroughly recovered, he will complain of headache, weakness, dizziness and nervousness, will become discouraged and will develop a series of fear complexes. Therefore, whether the patient remains in the hospital or returns to his home he should be kept under supervision and directed concerning his activities, his diet and rehabilitative measures. A patient who has sustained a serious craniocerebral injury should not be permitted to return to his regular work for from four to eight weeks. He should be encouraged to rest and sleep several hours during the day, be allowed to sit up for only short periods at a time at the onset, take graduated exercises, and eat a well-balanced diet with limitation of fluids to 2,000 or 3,000 cc. per day. Saline cathartics may be required to regulate his intestinal habits for the first two weeks, following which he can depend on the proper selection of foods, including fruits, for the re-establishment of his intestinal habits. If palsies have developed, physical therapy should be administered. Frequent assurances should be given in order that the patient may regain confidence in himself.

In the event that irreparable damage has resulted from the craniocerebral injury, it becomes the duty of the attending surgeon to aid the patient in selecting a change of vocation and insurance adjustment, for if the surgeon is negligent in aiding the patient to rehabilitate himself the latter may become a permanent invalid instead of a useful or partly useful individual.

POSTTRAUMATIC SEQUELAE

The most common type of posttraumatic sequela is that of headache, dizziness and fear of being unable to work, losing one's job and not receiving adequate compensation for one's injury. The headache and dizziness may continue off and on for six months to two years. These two symptoms may result from a low-grade communicating hydrocephalus due to a failure to absorb the cerebrospinal fluid. The failure to absorb the cerebrospinal fluid probably is due to subarachnoid hemorrhage, low-

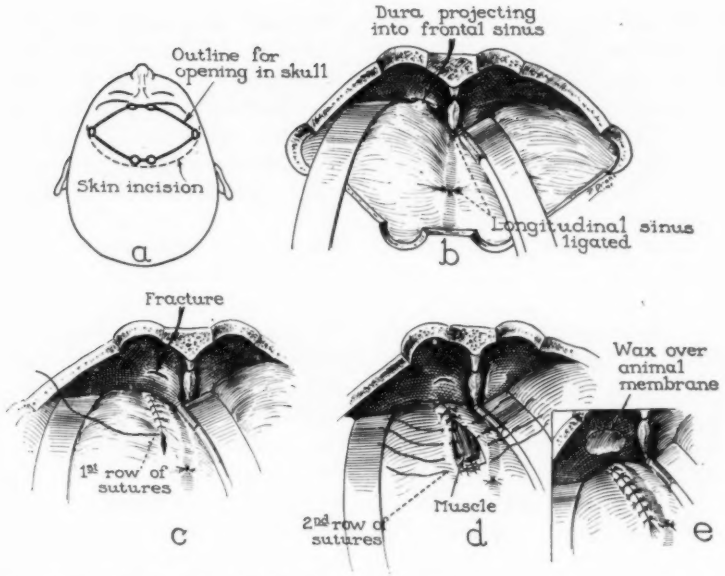

Fig. 5*a*. Schematic outline of incision in the scalp and craniotomy.
Fig. 5*b*. Elevation of dura, identification of the fistulous tract and ligation of the longitudinal sinus.
Fig. 5*c*. Closure of the dural tear with a suture of continuous catgut.
Fig. 5*d*. Re-enforcement of the primary closure by means of a second row of interrupted silk sutures, including a strip of muscle employed as additional protection against recurrence of the rhinorrhea.
Fig. 5*e*. Closure of bony opening with animal membrane and bone wax. From Adson, A. W.: Cerebrospinal rhinorrhea: surgical repair of craniosinus fistula. Ann. Surg. 114:697-705 (Oct.) 1941.

grade leptomeningitis and a fibrosis of certain stomas in the pacchionian bodies. The final adjustment of secretion and absorption results when an automatic balance between the two takes place. Limitation of fluids to 1,800 cc. a day and the occasional administration of a saline cathartic appear to give some relief from headache and dizziness. Sedatives occasionally are resorted to, but usually acetylsalicylic acid is sufficient. The economic fears are eliminated by not forcing the patient to return to work before he is able and by making sure that he is capable of fulfilling the tasks assigned to him and that a fair compensation has been made, either by the insurance company or by the industrial labor commission.

Epilepsy—Epilepsy occurs in about 5 per cent of craniocerebral injuries. It occurs most frequently when the frontotemporoparietal regions have been traumatized. Convulsions may occur at the time of injury or may appear weeks, months or years subsequently, and the extent of the injury is not always an indication as to whether or not epilepsy will develop. Occasionally convulsive seizures may be eliminated on the resection of the focal scars or the evacuation of traumatic cysts, but more often than not surgical procedures for the treatment of posttraumatic epilepsy are disappointing. The medical treatment consists of medication, the use of sedatives such as phenobarbital, bromides, dilantin and tridione. A medical regimen of dehydration and the use of a ketogenic diet have offered assistance in the treatment of epilepsy.

Posttraumatic psychosis—Posttraumatic psy-

chosis, though not common, does occur. In a few instances it is temporary; however, evidence of cerebral deterioration persists though the manic symptoms may subside.

Cerebral abscess[2]—Suppurative head wounds and cerebral abscesses have been greatly reduced in frequency with the introduction of débridement procedures and the ample use of the sulfonamides and penicillin. Sulfanilamide may be used in wounds where brain tissue has been lacerated, but this cannot be said of sulfathiazole. Penicillin may be applied directly to a craniocerebral wound. A solution of the same may be used to irrigate a lacerated wound of the brain. Although local application of sulfanilamide and penicillin is effective in reducing incidence of suppuration, administration of sulfanilamide by mouth and of penicillin by intramuscular or intravenous injections is much more effective. Administration should be continued for one week as a prophylactic measure to prevent cerebral abscess when missiles or fragments of scalp or bone have been driven into the brain. Symptoms of a developing cerebral abscess may not appear for ten to twenty days following the injury. The most suitable time to drain such abscesses is when encapsulation of the abscess has taken place. This can be recognized by an approach of the septic type of temperature curve to normal and a fall of the leukocyte count. The abscess should be drained at the point of cerebral injury. Adequate and thorough drainage should be instituted in two to three weeks from the onset of the abscess. The drainage tube should be left in place for another two or three weeks, the tube being shortened as the cavity closes and granulates from the bottom.

Skull defects—Skull defects resulting from the removal of fragments of bone in a compound comminuted fracture of the skull do not always need plastic closures when they are small or are located over postcentral areas of the brain. However, if they are extensive or are located in the frontal area, a plastic closure is indicated even though it may only be for cosmetic reasons.

Our war experiences have shown that tantalum plate is the metal of choice, since it is inert and malleable. I should like to quote from my colleague, Dr. George S. Baker, who has had an extensive war experience with the use of tantalum in closing defects in the skull.

"A tantalum plate can be easily made at the operating table[4] when the defect is not complicated. The defects difficult to repair are those that occur in the frontal bone with involvement of the frontal sinuses. In these cases the cosmetic result is of paramount importance. Few special instruments are necessary for making the plate at the table and these can be sterilized with others that are necessary to complete the operation. The size of the defect is measured by a piece of sterile lead foil or cottonoid. The tantalum plate is then cut with scissors from the pattern. It is easily shaped by hammering over a concave metal mold until it assumes the contour of the removed bone.

"When the operation is a secondary one, it is perhaps best to mold the plate prior to operation by the die and counter die method (Fig. 1)[11] or by the direct method (Figs. 2 and 3).[4] The scalp is cleanly shaved and in each case an identical mold of the defect is obtained, allowing one-quarter to one-half inch (0.6 to 1.3 cm.) extension beyond the edge of the bone. The plate is cut to proper size. Either it is hammered into shape on the mold or a power press is used to swage the metal. The latter method is recommended when a press is available. The thickness of the temporal muscle must always be accommodated for making plates in the temporal region. Small holes can be made in the plate with a Crutchfield brace and dental burr, or a metal punch. When the finished plate is sterilized it is ready for insertion.

TECHNIC OF CRANIOPLASTY WITH TANTALUM PLATE

"The scalp is cleanly shaved and prepared for operation as in craniotomy. Local anesthesia is recommended in most cases, but complicated repairs are best handled while the patient is under general anesthesia or a combination of the two. Attempts should be made to resect scars of the scalp when secondary procedures

are being done. The primary repairs are completed through the original exposure, but in secondary operations it may be necessary to make a new incision for adequate blood supply to the flap and for better exposure of the defect. Once the area has been satisfactorily exposed two methods of insertion of the plate are in use to complete the cranioplasty; namely, the onlay method and the inlay method described by Hemberger, Whitcomb and Woodhall.[12] The secondary repairs often require injection of solution of penicillin (10,000 units per cubic centimeter) under the plate or scalp flap as prophylaxis against reinfection. Fibrin foam that has been saturated with penicillin and thrombin has been used to good advantage by the author in such cases when control of hemostasis was difficult in old scar tissue and a concentration of penicillin was desirable for bacteriostasis to safeguard against infection.

"Compression dressings of sponge latex or mechanic's waste are advisable to prevent accumulation of fluid beneath the flap. When fluid appears it should be removed by aspiration and a compression dressing should be reapplied. The tissues of the scalp soon become adherent to the tantalum plate and it is a very rare occasion when the plate has to be removed because of foreign body reaction.

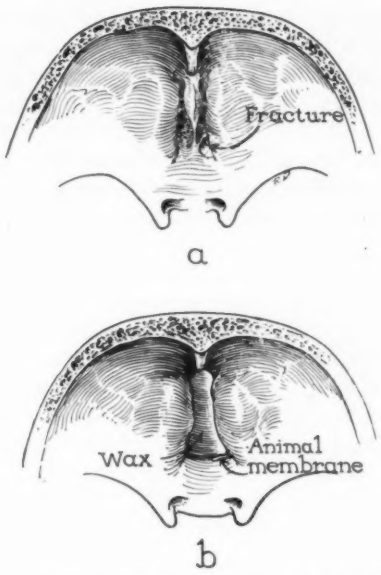

Fig. 6*a*. Fracture of the cribriform plate; *b*, closure of the bony defect with animal membrane and bone wax. From Adson, A. W.: Cerebrospinal rhinorrhea: surgical repair of craniosinus fistula. Ann. Surg. 114:697-705 (Oct.) 1941.

CONCLUSIONS

"The cosmetic appearance of patients who have submitted to cranioplasty has been unusually gratifying. The physiologic effect of covering the defect of the skull in posttraumatic cases has invariably improved the symptoms of vertigo and headache. The psychologic advantage to the patient has been a notable accomplishment."

CEREBROSPINAL RHINORRHEA

Causation—Cerebrospinal rhinorrhea[3] may result from a number of causes, the most common of which is skull fracture that extends through the posterior wall of the frontal sinus (Figs. 4a and b) or the cribriform plate of the ethmoid bone, with accompanying tears of the dura and arachnoid.[5, 10] The first evidence of rhinorrhea associated with fracture of the skull is the occurrence of a watery, bloody discharge from the nose. In most instances, in my experience, the lesions heal with spontaneous remission of the rhinorrhea. Persistent rhinorrhea or the delayed occurrence of rhinorrhea usually is due to considerable loss of bone, absorption of a fragment of bone or inclusion of the dura and arachnoid between fragments of bone, which permits escape of cerebrospinal fluid into one of the nasal cavities.

Cerebrospinal rhinorrhea frequently has occurred spontaneously. When it does occur, it probably is the result of a congenital defect in the cribriform plate which permits extension of an envelope of arachnoid along an olfactory nerve fiber through the cribriform plate. Leakage of cerebrospinal fluid undoubtedly is the result of rupture of the thinned-out arachnoid

and mucous membrane. According to reviews in the literature, precipitation of this type of rhinorrhea usually is the result of coughing or sneezing during an attack of head cold. Rhinorrhea has accompanied hydrocephalus, and in that particular instance leakage of cerebrospinal fluid was the result of increased intracranial pressure on thinned-out membranes and absorptive defects of the cribriform plate. I have also seen the condition afflict two patients suffering from pituitary tumor. The floor of the sella turcica had been absorbed, with presumable leakage of cerebrospinal fluid into the sphenoidal sinus. I also saw the condition when a large osteoma of the orbit had extended through the ethmoid into the anterior fossa.

RHINORRHEA also has followed removal of nasal polyps. The polyps probably were meningoceles that had extended through the cribriform plate. Rhinorrhea also has resulted from craniotomy when, in the making of the anterior margin of the bone flap, the frontal sinus was unintentionally opened.

Symptoms and signs—The only symptom that many patients complain of is an annoying, watery discharge of the nose. It may be continuous or cease for only a few hours before it recurs. The discharge may appear as drops of clear fluid or it may pour out in a stream when the head is tilted in certain positions. Usually, it appears in one side of the nose and produces the sensation that is experienced when the nose is congested. In acute injuries of the head, it may be difficult to recognize cerebrospinal fluid because it is mixed with blood, but when the condition is chronic the fluid is watery and can be readily collected and examined chemically. Cerebrospinal fluid is colorless, limpid, slightly viscous, has a specific gravity of 1.004 to 1.008, and contains traces of protein and small quantities of inorganic salt and dextrose. The lymphocyte count varies from 5 to 10 cells per cubic centimeter of fluid.

If there is doubt about the presence of cerebrospinal fluid in a discharge from the nose, the indigo carmine test, in which 1 cc. of indigo carmine is introduced into the subarachnoid space of the spinal canal by means of routine spinal puncture, might be employed. Since the dye promptly stains the cerebrospinal fluid, a bluish green color will be seen to appear in the nasal discharge within about fifteen minutes and will continue for two or three hours, if fluid discharging from the nose contains cerebrospinal fluid. This test is of particular value in the differentiation between cerebrospinal rhinorrhea and allergic and vascular rhinorrhea. Roentgenologic examination of the skull offers some aid in the diagnosis in cases of recent fracture, but rarely is such examination of much assistance in the localization of cerebrospinal fistula involving the ethmoid cell.

Meningitis is the serious complication which may result from cerebrospinal rhinorrhea. It occurs more often when rhinorrhea results from fracture of the skull than it does when rhinorrhea occurs spontaneously, but it is a constant threat in all cases, and especially so when the patient has contracted a nasopharyngeal infection. Fortunately, chemotherapy has proved of value in combating meningitis and also has made it possible to perform the extensive operations for closure of craniosinal fistulas without fear of the development of meningitis.

Conservative treatment—Conservative treatment (nonoperative) often has been employed by those who feared to advise or employ the radical procedure designed to close the fistulous tract. The argument set forth by those who advocate conservative treatment is that they believe it safer not to disturb the patient than it would be to hazard a radical operation. Unfortunately, there is little to offer in the way of nonoperative treatment.

Surgical treatment—The accepted procedures for closure of craniosinal fistulas which communicate with the frontal sinus, the ethmoid cells or the nasal cavity have been: (1) in cases in which the condition is acute, surgical repair through the frontal sinus; (2) in cases in which the condition is chronic and it is possible to identify the site of the lesion, performance of small unilateral transfrontal craniotomy, identification of the fistula and closure of the

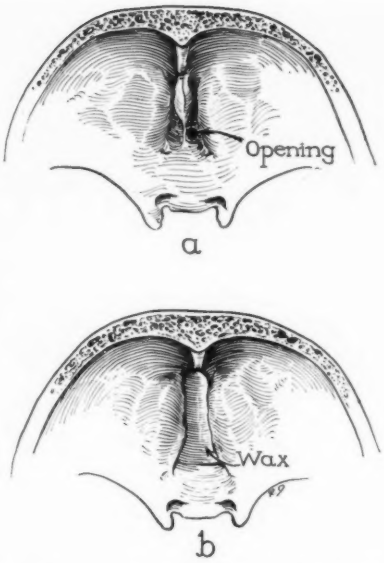

Fig. 7*a*. Congenital defect of the ethmoid bone; *b*, closure of the bony defect with wax. From Adson, A. W.: Cerebrospinal rhinorrhea; surgical repair of craniosinus fistula. Ann. Surg. 114:697-705 (Oct.) 1941.

meningeal opening with interrupted silk sutures or closure of it with sutures and covering of it with muscle; or (3) performance of unilateral transfrontal craniotomy, in which the dura is elevated, the opening is identified and a wick of iodoform gauze is placed between the lacerated dura and the cribriform plate, as Peet has advocated. The end of the gauze wick is brought out through the frontal incision but the wick itself is left in place for four days and then carefully removed. Peet[13] stated, "The object of this procedure is to prevent meningitis by allowing the brain to become firmly adherent to the lacerated dura, thereby effectively closing off the subarachnoid space before organisms passing through from the nose can cause infection."

I have used these accepted procedures with varied success; the one difficulty that I always have encountered in attempting to free the dura from the cribriform plate is that the dura has had a tendency to tear, as Grant emphasized in his discussion of Coleman's paper. The dura, in addition to being thin, is likewise under moderate tension, preventing the carrying out of proper overlapping of the dura which is necessary for thorough invagination of the meningeal fistulous tract. I have included muscle in the suture line to assure against leakage of cerebrospinal fluid. I have further attempted to assure against recurrence of rhinorrhea by filling the bony defect with Horsley's bone wax (Fig. 4c), but in spite of all these precautions, recurrence of rhinorrhea has occurred. This failure prompted development of the operation employed in these cases of chronic rhinorrhea, in which cure has been obtained.

THE PROCEDURE consists of performance of craniotomy which will allow the dura to be elevated from the bone in both halves of the frontal fossa. The bone flap must be designed so as to extend across the midline and to uncover the anterior poles of both frontal lobes (Fig. 5a). A coronal scalp-flap incision is employed. It is placed within the hairline, after which the scalp and periosteum are reflected forward to a line just above the frontal sinus. Six trephine openings are made, the first two of which are placed on each side of the midline just above the frontal sinus. The second two trephine openings are placed on each side of the midline and the longitudinal sinus, approximately 3 cm. in front of the coronal suture. The third two openings are placed in the temporofrontal region, one on each side. As the bone between all the openings is cut with a Gigli saw, an opening is effected which is sufficient to permit elevation of the dura and the frontal lobes. The bone flap is kept sterile during the operation by means of a sponge soaked with saline solution.

Caution is taken to avoid injury to the longitudinal sinus. Bleeding from the longitudinal sinus is controlled by ligation of the sinus (Fig. 5b) with silk ligatures at a level 6 cm. above the foramen cecum, which is situated superior to the crista galli. In some instances, it is necessary to ligate the longitudinal sinus where it communicates with the foramen cecum. The advantage of ligation of the longitudinal sinus is that it allows the dura to be sutured into, and,

if necessary, to be used in closure of the fistulous tract. The procedure is continued by elevation of the dura from the frontal fossa and the olfactory grooves, where it is necessary to sacrifice the olfactory nerves. The elevation of the dura is continued until the anterior crest of the sella turcica is approached. During this dissection, the fistulous tract is always encountered, whether it be situated on the right or the left side. The meninges will be seen to extend into the defect of the frontal sinus or the cribriform plate.

After the dura has been mobilized sufficiently and the fistulous tract has been identified, plastic closure of the tract is begun by overlapping of the dura in such a way as to invaginate the meningeal portion of the fistula. The first suture is placed in the most dependent part of the elevated dura (Fig. 5c). The suture is No. 0 continuous chromic catgut. The primary line of suture is protected by a strip of muscle which is transfixed to the dura and further reinforced by the placing of a second row of interrupted silk sutures (Fig. 5d). The defect in the frontal sinus or cribriform plate is filled with Horsley's bone wax. Further to protect against forcing of the wax through the cranial defect into the sinus or nose, Lukens' animal membrane is placed over the defect before the introduction of wax to plug the hole (Figs. 5e, 6 and 7).

The advantages of bifrontal craniotomy are: (1) A better exposure is obtained than by employment of a unifrontal flap; (2) the surgeon is always sure to identify the fistulous tract; (3) the exposure thus obtained affords a better opportunity for elevation of the meninges along the cribriform plate; and (4) after elevation of the dura from the cribriform plate, tension on the dura is relieved; this permits greater ease of invagination of the fistulous tract and successful performance of overlapping dural closure of meningeal defects. The postoperative appearance of one patient who had a congenital defect in the ethmoid bone is shown in Fig. 8.

Fig. 8. Postoperative appearance of the patient who had the congenital defect in the ethmoid bone. From Adson, A. W.: Cerebrospinal rhinorrhea: surgical repair of craniosinus fistula. Ann. Surg. 114:697-705 (Oct.) 1941.

Before replacement of the bone flap, thorough hemostasis should be effected. A rubber tissue drain can be used but is not necessary because no cerebrospinal fluid will be seen to escape. The bone flap is wired in place with noncorrosive wire, inserted through perforations which are placed opposite each other in the skull and bone flap. The periosteum, galea and scalp are closed with interrupted silk sutures.

As a precautionary measure, administration of sulfanilamide is continued for three days prior to operation until the concentration of sulfanilamide in the blood reaches a value of from 8 to 12 mg. per 100 cc. Likewise, it is continued for ten days after operation, during which time the same concentration of the drug in the blood is maintained. The dosage that I have employed ranged from 45 grains (3 gm.) to 90 grains (6 gm.) per day. In no instance did meningitis develop during the postoperative period.

Fractures of the skull extending into the base and involving the middle fossa result fairly frequently in tears of the blood vessels within the area and give rise to aneurysms and arterio-

venous fistulas between the intracranial portion of the internal carotid artery and the cavernous sinus. The treatment is designed to close the tear by inserting plugs of muscle into the internal carotid artery or to trap the fistulous opening by ligating the internal carotid artery in the neck and also ligating it within the cranium on the cerebral side of the aneurysm or the arteriovenous fistula. However, it should be borne in mind that no attempt at ligation should be done until it has been ascertained that a ligation can be performed without producing contralateral hemiparesis. This is accomplished by employing the Matas procedure, which consists in compressing the common carotid artery from a few minutes to thirty minutes three times a day without producing any untoward effects or paresis.

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Treatment of Acne

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Acne, the commonest disease process known to man, is a disease that requires the attention of every man in general practice and a great many men in the specialties. It is a disease that probably caused more man-hours lost during the war than almost any other condition, because complications of acne were foremost in all the theatres of the war where excessive heat, moisture and healthy young men were present. Acne, although it may sound like a simple thing, and it may be to some of you, is an exceedingly important subject from the standpoint of general care, man-hours lost in the war and the development of neuroses in young women and young men. Furthermore, it is a disease for which something can be done if we will but understand the basic process involved.

The incidence of the disease, I do not need to tell you, is exceedingly high. It is estimated by competent authorities that at least 50 per cent of young people between the ages of 17 and 25 manifest some degree of acne vulgaris. Personally I think that estimate is a little too low.

I shall not spend much time on the symptomatology of the disease because you are all acquainted with it and have all seen cases of acne. I merely want to call your attention to some of the more important features of the disease. Acne always begins as a dilatation of the duct of the sebaceous gland, a formation of a plug through hyperkeratosis of that duct, the backing up of secretion, the deposit of oily or lipoid substances, a secondary inflammatory reaction, the development of pustules, followed by discharge and scarring if the lesion is deep enough.

One of the complications of a later stage of acne is the rosacea type that comes in middle age. I shall have something to say regarding the treatment of this disfiguring condition. This used to be much more common than it is today, but we still quite frequently see patients with marked rhinophyma. The principal process in the development of rhinophyma is first the basis of acne, the development of rosacea, the cystic enlargement of the sebaceous glands of the skin of the nose, followed by the laying down of fibrous tissue from chronic inflammatory reaction. Treatment of this sort of condition is extremely satisfactory today.

The basis of severe rosacea with rhinophyma is always acne. Sebaceous follicles are dilated. Before appearance of a bulbous nose severe acne vulgaris with scarring and pitting occurs and the entire skin of cheeks, nose, forehead, chin and neck are filled with pits at the site of the old lesions of acne vulgaris.

Deep nodular lesions may develop and remain for many months before pustulation takes place, before there is sufficient inflammatory

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reaction to produce abscess. These lesions then break down and discharge to the outside, leaving pitted scars which are first red and after six months to a year become white. Many old lesions remain three, four and even five years. Obviously the patient experiences great mental disturbance and many young women go into hiding for periods of three, four, five, six, or ten years.

Typical in a young man with the same condition are comedones, commonly called blackheads, large cystic lesions, scarring and cystic lesions on the forehead.

If one understands the histogenesis of acne vulgaris, handling of the case becomes clear. There is a marked inflammatory reaction to lipoid substances with the presence of bacteria. First there is plugging of the duct; the secretion backs up; comedones form in the duct and the outer margin of the comedone turns black. You call it a blackhead, but actually that blackness is due to the oxidizing effect on the sulfides in the sebaceous secretion and the cells lining the duct. The color is not due to dirt or lack of washing the face.

Sooner or later, infection, which is always present, develops in the dammed-up secretion with the cellular elements. There is perforation of the membrane of the secreting gland, allowing lipoid substances to pass into the surrounding tissue and setting up a lipoid foreign-body reaction with secondary phagocytosis, inflammatory reaction, and the formation of an abscess. If the patient or doctor squeezes the lesion at this point, infection is squeezed out into the normal tissues to each side and a furuncle or a carbuncle is likely to form.

The rosacea type on the faces of individuals 45 to 50 or 55 years of age is made up more of a red papular element with more vascular dilatation around the lesion, giving rise to the telangiectasia or new capillary formation in the skin. There is usually less of the pustular element in rosacea.

IN TREATING patients for acne vulgaris the doctor should always remember that the normal course of the disease is one of quiescence and exacerbation. If one follows a group of, say, 100 patients with acne vulgaris over a period of three years without treatment, he will find that approximately 20 to 25 per cent clear up entirely in that time without any treatment; approximately 40 per cent more will be free of the disease half the time and will show active lesions the rest of the time and the remaining 35 per cent will show continuous acne with flare-ups and quiescences.

The etiology of the disease is also of great importance in the treatment. It is possible to have the patient show comedones at any age. We have seen comedones in babies a year and a half and two years of age. This undoubtedly is due to a disturbance in the balance of endocrine function. We know very little about it. It is unquestionably a premature endocrine stimulation of the sebaceous glands of the skin.

Heredity is an important factor in all acneform conditions—the seborrheic state, let us say. One inherits a skin which is blessed with a larger or lesser number of sebaceous glands; one also inherits a background of endocrine activity, and it is usual to note in an entire family of father and mother and several children that where one or both of the parents have acne, several of the children have it, and where acne is not present in the parents, few of the children have acne.

The next consideration regarding etiology is the presence of the acne bacillus. One can almost always demonstrate the acne bacillus in the lesions of acne vulgaris, that is, anywhere from the comedones through the nodules, papules, pustules, abscesses. That does not prove that the acne bacillus is the pathogenic agent. It is believed now by most observers that staphylococci are the principal secondary invaders. In a very high proportion of patients exhibiting acne lesions it is possible to grow staphylococci from the ducts of the sebaceous glands. They are nearly always present below the plug which forms in the duct, so that if conditions are right in the sebaceous gland, there is bound to be secondary infection sooner or later, with the formation of abscesses.

It was believed for some time by numerous

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observers that focal infection was important in the etiology of acne vulgaris and related states. Most observers at the present time, including myself, are of the opinion that it has no influence whatever that cannot be explained on an endocrine basis, because the endocrine balance is affected by all infections. I merely want to state that focal infection per se has nothing to do directly with the etiology of the disease. The same is true of intercurrent infections. It has been noted repeatedly that individuals suffering from intercurrent infections in the hospital are apt to develop an exacerbation of acne. Again, that is all explainable on an endocrine basis.

I want to say quite a few words regarding the nutritional factor in the etiology of acne. We have been through a great many years of observation, research and guessing in the use of diets in treating acne vulgaris. Fortunately I have gone through all of those periods. It is not sufficient to put ten or fifteen patients on a particular type of diet for three to six months and at the end of that time evaluate those cases and say, "Well, 50 per cent of them are better and therefore the credit belongs to that diet." That is merely the normal course of the disorder.

Thirty or more years ago and right up to within fairly recent times, ten or fifteen years ago, it was thought that a high carbohydrate diet was the principal factor in inducing acne vulgaris. In the past fifteen years there have been quite a number of series of patients put on high carbohydrate diets, patients with and without acne, to see the effect. Furthermore, quite a number of series of patients with acne vulgaris have been put on exceedingly low carbohydrate diets to note the effect. The consensus of most competent observers is that the amount of carbohydrates in the diet has no influence on the course of acne vulgaris.

I might dismiss the protein factor. No one has ever been able to demonstrate that there has been a protein factor in the causation of acne.

Within the last eight to ten years there have been a number of observations suggesting that a hyperlipemia with high fat diet was a definite factor in the production of acne, and in one of our most recent and honored textbooks on dermatology there is quite a treatise on fats or hyperlipemia as a definite factor in the cause of acne. There are many qualified men in this country today who believe that. I happen to be one of those individuals, however, who do not entirely agree with that stand, and for this reason: We took a series of 50 patients with acne and placed them on a very low fat diet. We saw no difference at all in the outcome from any of our others. Then we took 50 patients who had acne vulgaris and fed them high fat diets, and again we were unable to say there was any appreciable effect. Our next observation covered a series of patients with severe acne vulgaris, the worst cases having large nodular lesions, deep abscesses and cysts. We took very careful histories of their dietary régime as far back as the patient and the relatives could go, and we were unable to demonstrate that these patients ingested a high fat diet. As a matter of fact, from our experience we concluded that, if anything,

these patients with the severest acne had a low fat intake. So we are a bit skeptical that the high fat diet is much of a factor in the production of acne. I shall have more to say about that in a moment.

Next I want to speak about the glandular factor. It is well known from scientific observation that injections of the male sex hormone testosterone will induce acne. Furthermore, we know that eunuchs do not have acne. We also know from observation that a fairly high percentage of females with acne have a definite exacerbation of the acne at the menstrual period or the period of ovulation, two or three days prior to the menstrual period. That occurs in about 50 to 60 per cent of young females having acne.

There have been a great many observations along this line into which I shall not go, but I do want to say definitely that we have enough scientific evidence at the present time to indicate that an endocrine imbalance is the factor behind the production of acne vulgaris and is the primary factor.

There may be many secondary factors and a high fat diet inducing a hyperlipemia may enter into the picture. I want to emphasize, however, that an endocrine imbalance is the background of acne vulgaris, and it is possible to develop acne vulgaris with that endocrine imbalance without any evidence of a high fat diet. It is possible to have severe acne with an endocrine imbalance with an exceedingly low carbohydrate diet, and it is possible to have a severe acne without the patient's eating large quantities of chocolate, which has been incriminated.

We need more scientific observations in acne vulgaris before we jump at erroneous conclusions regarding food factors, but we now are certain that the endocrines have a great bearing on the problem.

There are a few other observations of importance that have been generally made, two of them along the same line. One is that constant blood-letting causes acne to disappear. It has been observed in groups of donors in emergencies where they have given large donations of blood that acne disappears. Some of the diet enthusiasts have stated that was due to reducing the hyperlipemia or the hyperglycemia. Actually, competent observers think it suggests a removal of excess quantities of hormonal substances.

I want to devote the few remaining moments to a discussion of treatment. In the first place, I want to eliminate some of the erroneous impressions that have been abroad in the last twenty years. One is regarding the value of vaccines. That, of course, has been exploded in our literature. Vaccines are of no value in acne vulgaris. Furthermore, staphylococcus toxoids are of no value.

I have already discussed the nutritional factor, and I might say that I am not at all against the use of a low fat diet as advised by many individuals. It does no harm, but from a purely scientific standpoint I cannot rely on that for results.

All estrogenic substances have proved failures under scientific observation. There have been enthusiasts who have reported original benefit. The injection of pregnancy urine has produced remarkable results in a rather high percentage of individuals in the age group of 17 to 25, and of course that brings up the question of antuitrin-S. The use of antuitrin-S in young people up to the age of 23 to 25 will have a definite beneficial effect in about 50 to 60 per cent of those individuals. The injections have to be given two or three times a week, and in sufficient dosage to produce a result, but the trouble with the treatment is that as soon as you stop it the acne returns. Therefore, it is a poor form of treatment and I believe most competent men have given it up.

The use of thyroid is definitely indicated in all cases of acne vulgaris. We know from careful observation of large series of patients with acne receiving no other treatment, that at least 50 per cent of the young group between the ages of puberty and 23 to 25 are benefited by thyroid medication. We usually start with ½ grain of the extract or double that amount of desiccated thyroid. In individuals who are ob-

viously hypothyroids we gradually increase the dose to one grain a day, watching the symptomatology at all times. We have found that it is of no value to take routine basal metabolic rates.

Ingestion of bromides and iodides should be discontinued. Bromides and iodides are follicular irritants and will cause any acne to become worse as well as start an acne in an individual otherwise free. That includes iodized salt.

Constipation is not a factor in acne and has nothing to do with it.

FINALLY, as to the use of surgery and x-ray, I am against the constant surgical opening and expression of all the comedones and small pustules which may be present. I would advise careful opening with a small sharp knife and curettage of any of the large cystic lesions. In our experience it is not necessary to be continually removing comedones and small pustules. It frequently produces more scarring than less.

There is no question at all that at the present time x-ray is still a necessary and exceedingly valuable adjunct in the treatment of acne vulgaris. It must be given by an experienced, trained individual, preferably by one who knows dermatology. I do not advise the system of weekly treatments of a set dosage for a certain number of treatments. Every patient should be individualized and treated accordingly.

To those of you who are interested in x-ray, let me say that for the average case of acne the kilovoltage should not exceed 70. You want soft rays that will not penetrate more than 2 mm. For individuals who have cystic lesions, you must use a harder type of ray, preferably one with 70 kilovolts, using 1 mm. of aluminum filtration.

The treatment should be carried on at a very safe dosage and for a safe period of time. Reliance, however, on x-ray alone to cure patients with acne vulgaris is a mistake.

In addition to the use of x-ray we might mention local applications. Any method that will cause the skin to peel is good treatment, whether it be sunlight, lotio alba or any other solution. I particularly want to recommend for local use one of the newer preparations, intradermal sulphur, advocated by Dr. George M. MacKee of New York City. It consists of a penetrating sulphur compound put up in a penetrating vehicle, and it assists materially in exfoliating the epidermis.

Common Errors in the Treatment of Fractures

WITH PARTICULAR REFERENCE TO FRACTURES OF THE EXTREMITIES

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ERRORS commonly observed in the management of fractures, and I am afraid commonly committed by a good many of us, may be classified as follows:

Too vigorous manipulation of the fracture without first securing muscle relaxation by traction. In the great majority of fractures simple relaxation and early traction will reduce the deformity. In my own opinion, manipulation is likely to cause more complications than the initial injury.

Inadequate immobilization of the fracture, with resultant deformity and disability.

Failure to maintain proper weight bearing and the correct carrying angle. Both posterior and medial displacement tend to increase, and are usually both crippling and deforming.

Failure to wash the injured member before applying moleskin adhesive tape. Ordinary adhesive tape should not be used; it frequently tears, and it causes excoriations and blisters. The moleskin should be parallel to the arm or leg to which traction is applied and never crisscrossed. It is secured by an elastic bandage. It should be remembered that skin traction is efficient only on the humerus and femur; when it is limited to these bones, direct suspension traction is a most important method of securing immobilization. Skeletal traction is indicated on the lower leg or the forearm, and cardinal principles are violated when adhesive traction is applied to them.

An attempt to hold a fracture in the correct position by some sort of pressure apparatus. This usually results in ischemia at the fracture site, and eventual nonunion.

Too early removal of the cast and too early weight bearing in fractures of the lower extremities. Fractures, generally speaking, heal within certain periods of time, but individual fractures do not follow the schedule, and the only way that one can determine what has happened in any special case is by x-ray evidence.

Failure to remember that the initial application of a cast, even with the fracture in good position, does not end physician's responsibility. The position is lost as swelling and edema decrease and disappear, and a new cast is necessary to meet the changed conditions. My opinion is that all fractures, after reduction, should be immobilized either by a posterior mold cast or a three-quarter cast, supplemented by an elastic bandage to provide for reduction in the swelling and edema. At the

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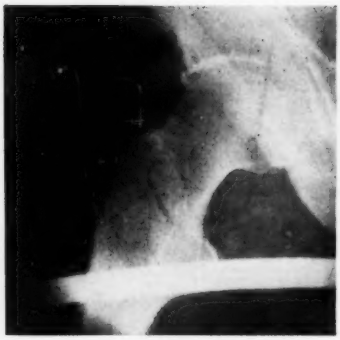


Fig. 1

Fig. 2

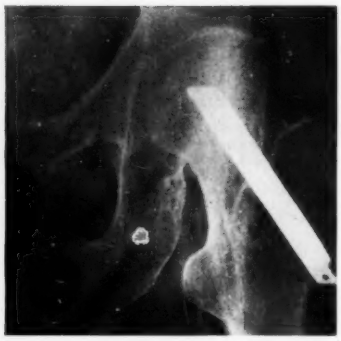


Fig. 3

Fig. 1. Valgus position for intertrochanteric fracture. Attempts should be made to secure this position. Fig. 2 (center) Coxa vara deformity following intertrochanteric fracture. Poor results follow this position. Fig. 3. Flange for immobilization of fracture of neck of femur.

end of a week or ten days when the edema and swelling have subsided, a second cast should be applied, which at this time can be safely circularized.

Failure to observe, as well as to record, the status of the pulse and the neurologic status of the extremity at the time of initial treatment. The physician will save himself much embarrassment, and patients will be saved much disability, if these simple precautions are always remembered.

Most errors encountered in the treatment of fractures of the extremities are errors of omission. Most of them, as is evident from the brief outline I have just given, would be avoided if only we bore in mind the basic principles.

Bearing these basic principles in mind, let us see how best to avoid common errors in the management of specific bones.

Fractures of the hip and femur—End results in dislocations of the hip associated with fractures of the femoral head or of the acetabulum differ from immediate results. Many times the results seem good, and continue good for a year or two. Four or five years later, however, there is a narrowing of the joint space and eventual aseptic necrosis; that happens in perhaps 90 to 95 per cent of all cases, and we must bear it in mind when we are confronted with patients who have suffered such an injury and must give a prognosis. When dislocation occurs without fractures, this complication occurs in only about 5 per cent of all cases.

A fracture of the femoral shaft with a wide amount of separation may present two types of deformity to be corrected, posterior displacement and medial angulation. It is always proper to employ traction of 20 to 30 pounds initially and to continue it for a period of perhaps ten days. If at the end of that time reduction is not satisfactory, it is not likely ever to be, and the best interests of the patient demand a prompt resort to an open operation.

Fractures of the femur in children with a large amount of overriding are particularly hard to handle unless they are seen promptly. In fact, unless they are seen and treated promptly there is practically no amount of traction which will effect a reduction. The reason is the hematoma present at the fracture site. If it becomes organized, as it does at the end of six hours, it will invade the soft tissue and lessen the coefficient of elasticity, making traction, as a result, a thoroughly unsatisfactory method of management. Surgery should, however, be avoided unless there is soft tissue interposition, or marked overriding of the fragments.

Intertrochanteric fractures are very generally

mistreated, more commonly so, I believe than any other type of fracture. One reason is that in spite of their importance, modern textbooks devote almost no attention to them. Text after text dismisses them with only 5 or 6 lines. The circumstances of treatment, of course, are not easy. The average age of the patient with this variety of fracture is about 67 years. The spine is likely to be arthritic. Coxa-vara deformity is frequently associated with the injury, and the result is usually a shortening of about an inch, for which the spine or pelvis cannot adequately compensate. The patients, if they are not treated with these possibilities in mind, frequently have very severe pain, not in the hip, but in the back.

Objective of treatment of an intertrochanteric fracture, whether managed by traction, with adhesive tape, traction splints or a cast, is that the leg should be approximately an inch or at least three-quarters of an inch longer than the uninjured member, and in a valgus rather than a vara position. If x-rays are compared in which treatment is carried out with this objective and without this objective, the difference in results is obvious. The desired elongation can be secured by changing the angle to a valgus which eliminates at once the undesirable coxa-vara position and the chain of consequences which follow its use.

Another type of fracture which is very common and which sometimes causes trouble is the intertrochanteric fracture with avulsion of the lesser trochanter. It can be treated just as the usual intertrochanteric fracture, that is, by traction alone, or by traction followed by a body cast. For intertrochanteric fractures without comminution, immobilization by means of internal fixation is satisfactory. If, however, the fracture is comminuted, it is an error to try to use any type of internal fixation; the results are never good.

IMMEDIATE application of the maximum amount of weight, that is, 20-30 pounds, not only reduces the fracture, but also reduces muscle spasm and indirectly benefits any state of shock, which may be present. Within a week or ten days after the injury most patients will be relieved of the muscle spasm. When that has been achieved, the precise type of treatment can be left to the desires of the individual surgeon. Closed reduction or open reduction with the application of a body cast gives equally good results.

The type and application of the apparatus are important. The weight should extend free over the end of the bed, so that the patient does not have access to it. A small weight in the center, to give suspension traction, permits the patient to raise himself in bed, making nursing a little easier. The ring of the Thomas splint

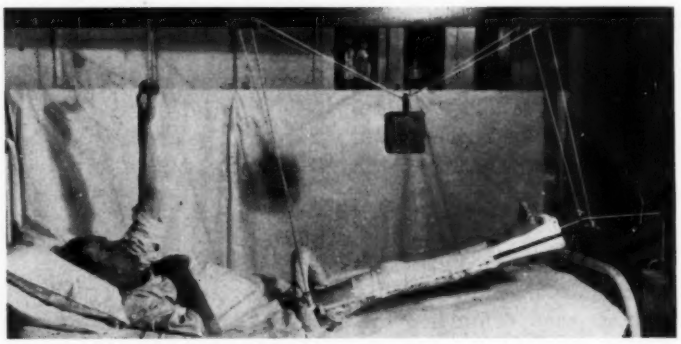


Fig. 4. Direct suspension traction.

Fig. 5 (left). Avulsion fracture of greater tuberosity with dislocation of head of humerus. Fig. 6. Avulsion of greater tuberosity following reduction of dislocation. This requires surgery.

should be large; a small ring permits pressure and may result in such unfortunate consequences as a pressure necrosis, especially over the ischial tuberosity, sciatic nerve involvement and thrombophlebitis. The correct weight bearing line should be adhered to, namely, from the anteriosuperior spine of the ilium through the patella and extending between the first and second toes. If these precautions are observed, and if slings are placed correctly across the bar, two very crippling and disabling deformities are prevented, namely, a medial angulation and a posterior displacement.

A very common error in the treatment of fractures of the neck of the femur is the incorrect use of pins and wires. If some form of immobilization is to be used for fractures of the neck of the femur, wires should not be used, they will either pull out or bend. The use of a flange, or of two screws, will adequately immobilize the fracture.

AN IMPORTANT rule in the management of fractures of the femur and fractures about the hip joint is that weight bearing should not be attempted for a minimum of six months. The precaution is nothing but common sense. As is very well known, deposition of bone by natural processes takes a minimum of three months, and another three months is required for the callus to become firm, hard, bone. Some type of ischial non-weight bearing caliper or brace should be employed for another three to six months, following immobilization, for additional protection.

Fractures about the ankle—A fracture of the internal malleolus running across the lower end of the tibia, with angulation at the mortise of the ankle, can produce a deformity that is crippling and disabling. The cancellous bone is usually driven up into the tibia by compression and dorsiflexion, and its removal is practically impossible unless proper early treatment is applied. If a Steinmann pin is inserted early in this type of case, results are usually good. If it is not, the ankle mortise can be restored and proper articulation of the tibia achieved only by osteotomy and transplantation of a portion of the tibia.

Fractures about the shoulder—One very common error in the management of fractures of the greater tuberosity associated with a dislocation is failure to reattach the greater tuberosity to the shaft of the humerus. As a rule, the dislocation has been properly reduced and the circulation and innervation of the region have been checked. (Incidentally, the findings should be appropriately recorded for the phy-

Fig. 7. Comminuted supracondylar fracture. Flexion too acute.

Fig. 8. Oblique fracture of humerus causing radial nerve paralysis. Fig. 9 (center). Screw in olecranon for traction. Fig. 10. Traction by means of screw in olecranon.

sician's own protection at a later date.) Yet often, at a later investigation, there is a concavity at the greater tuberosity, because it has not been reattached to the shaft. This is a serious problem. The external rotators, the infraspinatus and the teres minor attaching to the greater tuberosity are now pulled posteriorly and superiorly instead of externally and anteriorly as normally, and the patient has grossly impaired the functions of abduction and external rotation. If such a situation has developed, the treatment is always surgical. It is necessary to bring the tuberosity back to its normal anterior position, rotate the arm, and then reattach the tuberosity in order to regain the lost functions.

Supracondylar fractures—Textbooks teach that the correct position of treatment for supracondylar fractures of the humerus is acute flexion and supination. That is true, but on the other hand, exaggerated positions of any kind, whether flexion or extension, are to be avoided. Supination and flexion, improperly applied, can completely rotate the distal end of the humerus; the reverse error is failure to apply sufficient flexion to bring the bony surfaces together. It is common practice in these circumstances to blame the circulation. The operator's finger is kept on the pulse as the forearm is brought up in supination and flexion, which, of course, is quite proper, and immobilization is carried out at the angle; the pulse is regained. Again that is correct.

There is little or no reason, however, why within the next day or two when edema and swelling have lessened, the cast cannot be removed, the elbow flexed farther until the pulse is lost; then by slight extension the pulse is regained and immobilization in that position carried out. After two or three such manipulations the arm can be brought into acute flexion and supination and the deformity present after the first manipulation, because of interference with the circulation, completely eliminated. There is no excuse whatsoever for accepting the protection of the circulation as an excuse for a poor result. A little more vigilance and repeated manipulations, which can be carried out without anesthesia, will eventually result in the optimum position necessary to maintain reduction. I think it fair to say on the basis of my own observations, that some 60 per cent of the cases of supracondylar fractures are reduced at right angle flexion rather than in full supination and flexion.

Another unsatisfactory end result in a supracondylar fracture occurs in the oblique variety. If it heals with excess callus formation, a small spur may form and protrude laterally, the musculospiral nerve will invariably be caught in the fracture, just as it will be caught in a spiral fracture. Should this happen, osteotomy and neurolysis of the musculospiral nerve are the only solution. An oblique fracture, and particularly an oblique fracture which introduces any possibility of involvement of the musculospiral nerve, warrants early skeletal traction, or even surgery.

Skeletal traction in supracondylar fractures—In employing skeletal traction in this area, extreme care is necessary to safeguard the ulnar nerve. The use of a wire across the ulna, or the use of a drill or any other form of skeletal traction, can readily cause an ulnar paralysis, particularly if the nerve is displaced in a comminuted injury. My preference in such cases is to use an ordinary screw hook, such as can be bought in a hardware store for two or three cents. It is placed in the ulna about two fingers' distance from the tip of the olecranon process. A weight is then placed horizontally and traction applied. The forearm is supported with moleskin adhesive tape in a position of supination and flexion. The screw remains in position three or four weeks. If at the end of that time the fracture is not reduced, some other method must be used, but as a general rule even comminuted fractures can be reduced in good position by this simple method, which avoids injury to the ulnar nerve.

Fractures of the olecranon process—These are managed in extension, but one must realize that position is not everything. A fracture managed in the proper position can still show separation between the fragments; the important consideration is how great a tear of the capsule has occurred, just as in a fracture of the patella, in which a tear of the lateral capsule accompanies the deformity. Unless the olecranon is placed in its correct position, a dislocation of the forearm can occur when the elbow is in extension.

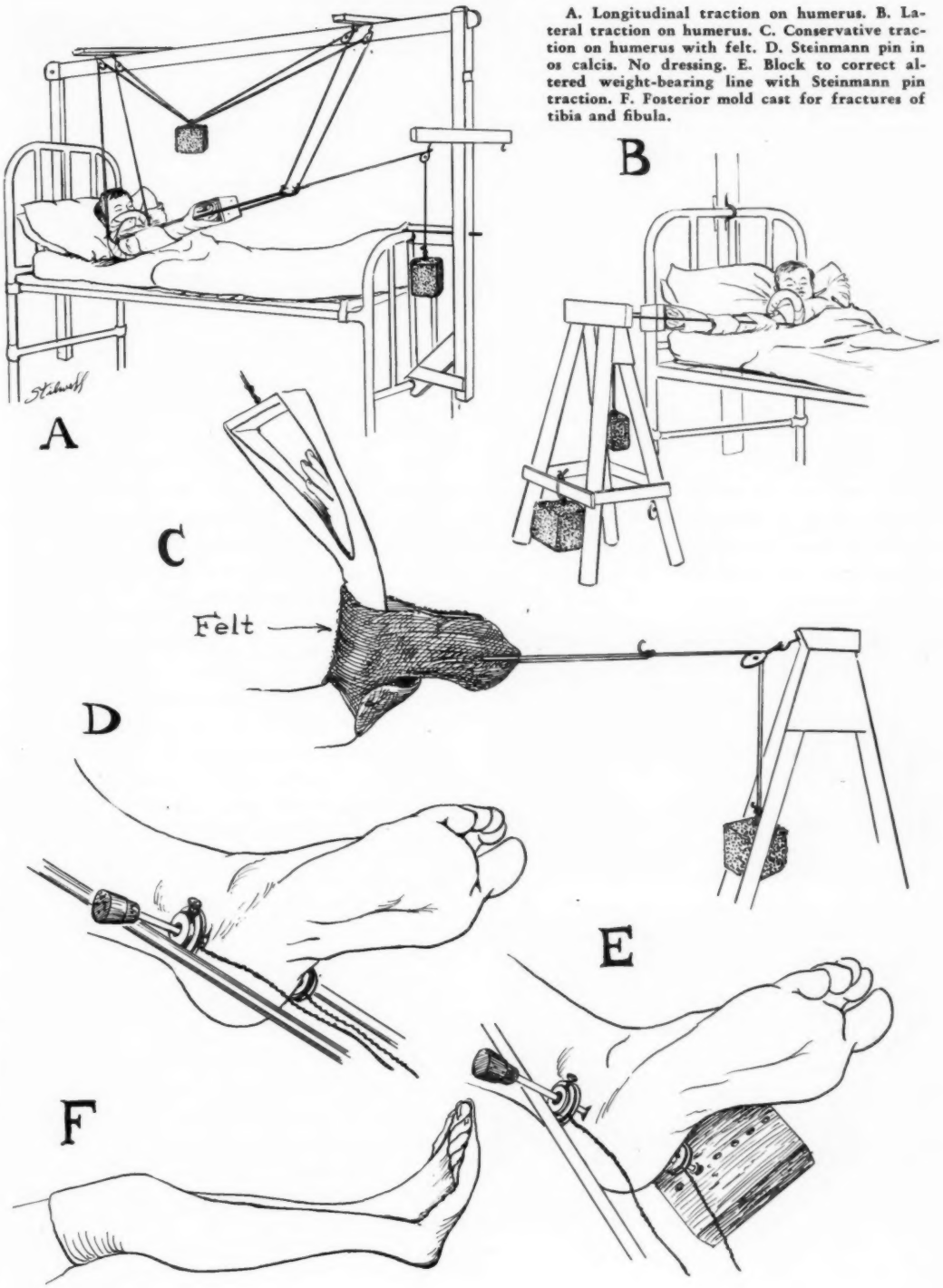
Fractures of the radius and ulna—Fractures of the head of the radius associated with fractures of the ulna, unless properly immobilized, often may produce a most serious type of deformity, with loss of flexion that amounts to a practical ankylosis of the elbow. The best way to handle a fracture dislocation of the head of the radius with a fracture of the ulna is to remove the head of the radius early, split the triceps, and put a screw through the proximal portion of the olecranon anteriorly down into the medullary canal. By this procedure anterior dislocation of both bones of the forearm is prevented and approximation secured. Motion can be started promptly and deformity and dysfunction are avoided.

A COMMON error in cases of fracture dislocation of the head of the radius associated with fracture of the middle third of the ulna is to remove the radial head at an early date without rigidly immobilizing the ulna. If the ulna is not protected by this rigid immobilization, the end result is inevitably bad.

Other difficulties also arise in cases in which the head of the radius is removed when the ulna is also fractured. Sometimes a small amount of callus formation will limit pronation and supination. If the radio-ulnar ligaments are torn at the wrist, shortening of the radius by resection of the head permits displacement of the distal normal radio-ulnar articulation under these circumstances, and the patient has a great deal of pain, not at the elbow, but at the wrist. I had one patient in whom resection of the lower end of the ulna was eventually necessary for relief of pain.

Still another precaution in both bone fractures of the forearm is the proper amount of immobilization of *both bones*, the ulna as well as radius. Indeed, immobilization above the elbow joint is always necessary to prevent marked deformity with loss of pronation and supination.

A convenient and a practical method of describing management of both-bone fractures of the forearm is to visualize the forearm in three sections. Fractures in the upper third



A. Longitudinal traction on humerus. B. Lateral traction on humerus. C. Conservative traction on humerus with felt. D. Steinmann pin in os calcis. No dressing. E. Block to correct altered weight-bearing line with Steinmann pin traction. F. Fosterior mold cast for fractures of tibia and fibula.

should be placed in supination and right angle flexion. Fractures in the middle third should be placed in midpronation. Fractures in the lower third should be placed in pronation. If these double fractures are placed in the correct position, even though there is overriding, a wire can be inserted through both bones for traction, and both fractures will immediately be immobilized in the correct position. If, however, the wire is inserted before the correct position is assured, the error is merely perpetuated and the position cannot be changed until the wire is taken out.

SOME fractures of the forearm cannot be put into good position by manipulation. A fracture involving the lower end of the radius with slight obliquity, or which is transverse, is almost impossible to reduce by manipulation, particularly if only the radius is fractured and the fracture is at the pronator quadratus. The proper way to manage such a case is by early surgery. The fracture can be "jack-knifed" into position through a small incision, and healing usually occurs rapidly and in excellent position.

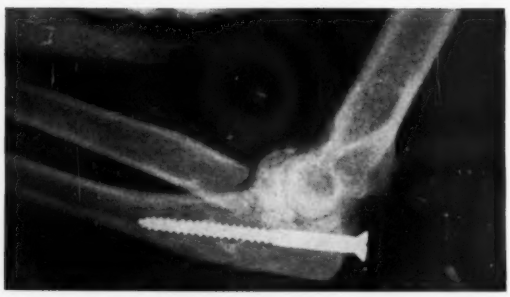


Fig. 11 (upper). Comminuted fracture of head of radius with fractured olecranon. Fig. 12 (lower). Removal of head of radius. Fracture of olecranon reduced and immobilized by metal screw.

Injuries at the wrist immobilized in plaster casts are not always as simple as they seem. I recollect one such case in which the styloid process of the radius was longer than that of the ulna. The distal articulation was normal, pointing forward 10 degrees, but a half-moon shadow in the roentgenogram was overlooked, and the patient, instead of having a Colles fracture, actually had a dislocation of the lunate bone. The proximal carpal row should always be investigated. These bones are likely to be involved in a fracture at the wrist; dislocation of the lunate bone and fracture of the navicular bone form a rather frequent combination. If the dislocation of the lunate bone is left unreduced, median nerve injury can be anticipated.

When a fragment of the navicular bone is dislocated up the forearm, the question always arises as to whether it should be replaced or resected. If there is marked displacement of the carpal bone, resection will inevitably produce a disability, which may be very marked. It is better policy to put the fragment back into position and take the chance that it will not die. A white sclerotic area always makes one think that the bone is dead; invariably it means inadequate circulation and time alone will tell whether sufficient nutrition for revascularization will be supplied. In bone pegging the fracture of the navicular bone, the peg need not be taken from the tibia; it is perfectly practical to take it from the radius, and immobilization is just as adequate as with a tibial peg.

It is a temptation, in dealing with a comminuted fracture of the lower end of the radius, to let severe comminution overshadow every other consideration. A review of the original x-ray may reveal a mere suggestion of a line, rather than a true fracture line, and recheck x-rays often reveal separation because of absorption at the fracture site. It should be axiomatic, in the management of comminuted fractures of the wrist, to pay particular attention to the proximal carpal row, because an overlooked fracture or dislocation may vitiate an otherwise good result.

Developmental Diagnosis of Infant and Child:

ITS ROLE IN CLINICAL MEDICINE

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DEVELOPMENT, as well as disease, falls within the scope of clinical medicine. This simple proposition has far reaching implications for pediatrics, for neuropsychiatry and for individualized public health. And the many general practitioners in this audience know they are constantly confronted by problems of child development. We cannot give adequate medical protection to the growing child, unless we are prepared to diagnose his capacity to grow.

This capacity to grow manifests itself in three major directions:—anatomic, physiologic, and behavioral. First and foremost, pediatrics is concerned with bodily nutrition and with the somatic signs of health and well-being. But this is only a beginning. The basic maturity of the child is manifested in his behavior characteristics—in his ability to use his senses, his muscles, and his total action system to meet the demands of life. A man may be as old as his arteries; a baby is as old as his behavior.

To diagnose development, therefore, we must diagnose behavior. This can be done because the very patterns of the child's behavior are shaped in accordance with deep-seated natural laws. A million years of human evolution have left their imprint on the progressions of child development. The body grows; behavior grows.

At our Clinic of Child Development at the School of Medicine of Yale University, we have charted the ontogenetic sequences of these basic behavior patterns. Using normal infants as our subjects, we set up a series of test situations designed to elicit characteristic reactions in four major fields of behavior: motor, adaptive, language, and personal-social. All told, we have charted 34 age levels from birth to age ten. In the interest of preventive medicine, special attention was given to the period of infancy. A large group of normal, average infants were studied at lunar month intervals throughout the first year of life. Over a thousand behavior items were listed. This provided us a very finely graded age scale of developmental norms. These norms can now be critically applied as diagnostic criteria to identify behavior in terms of age, and to interpret maturity in terms of behavior.

Let me illustrate the underlying principles and methods with the aid of three cubes. Assume an infant 16 weeks old seated in a washable Morris chair in front of a test table. In actual practice, we use a red one-inch cube which has a universal appeal for the normal infant. The cube elicits a characteristic behavior pattern. It provokes his oculo-motor muscles: he looks at the cube; presently he looks at his own hand; and then again at the cube. This shift of attention makes a behavior pattern. It

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is as observable and as symptomatological as a knee-jerk. It is a behavior symptom which registers a 16 weeks level of maturity. At 28 weeks of age, eyes and hands coordinate to produce a more advanced pattern of behavior. The infant grasps the cube on sight and transfers it from hand to hand—a new kind of attention shift; a higher degree of maturity. At 40 weeks, the range and shifts of behavior are still more advanced; but are just as patterned and as open to diagnostic inspection. The infant seizes a cube with deft thumb opposition; he seizes a second cube; he combines the two cubes, bringing them together by way of adaptive exploitation. At 12 months, he can pick up each cube in turn and release it voluntarily. At 18 months, he builds a tower of three cubes; at 2 years, a wall; at 3 years, a bridge.

EXAMINATION materials shown in the accompanying illustrations are simple in design but effective in their property of stimulating natural, interested behavior. Characteristic behavior patterns are depicted at lunar month intervals, covering the first year of life. These behavior patterns are delineated to show growth trends and a specimen schedule. Diagnostic items for the four major fields of behavior (motor, adaptive, language, personal-social) are listed for the key age of 40 weeks with adjacent listings of developmental items characteristic of 36 weeks and 44 weeks.

Behavior patterns typical of 40 weeks are: exploitation of the cube, extension of the index finger, banging and alertness to the social environment. The exploitation is more diversified when two cubes are offered. The cubes are brought into relation, matched and contacted. The child gives definite attention to the two cubes, something he could not do at 28 weeks. Though the child gives heed to the third cube, he holds to the cubes in his hand. All this exploitive behavior certifies to the child's normality.

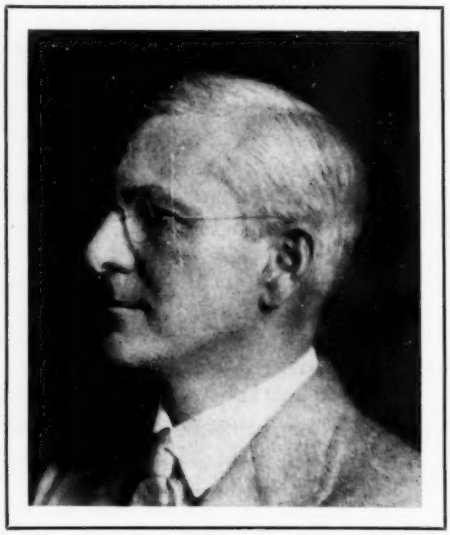
In the pellet situation, the child succeeds in momentarily grasping the pellet. The characteristic index finger, distinctive of this age, again comes to the fore when he pokes the pellet in the bottle. This is a clear-cut neurological sign, a maturity indicator. He gives special heed now to the bottle, now to the pellet, but is unable to insert the pellet in the bottle.

Given a bell, the child seizes the handle discriminately at the top, waves it, spontaneously pokes at it.

When offered a string and ring he adaptively plucks the end, tugs it to the proper distance, exploits the ring and string diversely in a manner which satisfies the developmental norms of behavior for this age.

The developmental examination includes a test and inspection of postural abilities. At 40 weeks supported standing is characteristic and the child also shows a capacity to sit independently.

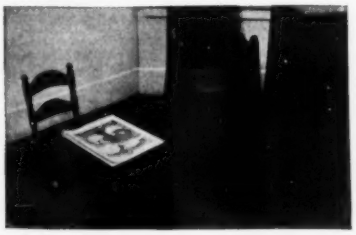
A cinema was shown delineating the behavior patterns of a normal 40 weeks old infant. For clinical comparison and differential diagnosis, the author presented an excerpt of the record of another 40 weeks old infant whose behavior has been distorted and reduced by cerebral palsy—a minimal, selective birth injury from trauma.



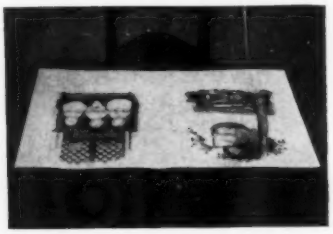
Arnold L. Gesell

A., B. High chair used at fifteen months and for older children unable to sit without extra support; examining table. Note method of attachment to chair. Height of table is adjustable.

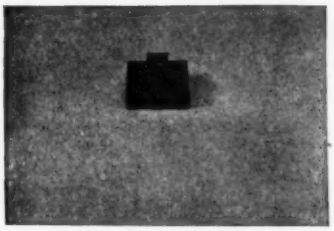
C. Room arranged for examination with high chair.



D., E. Standard examination setup.



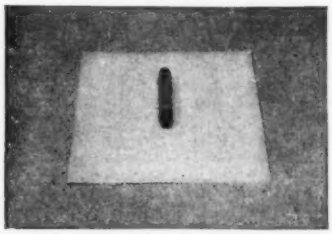
F. Picture book on table.



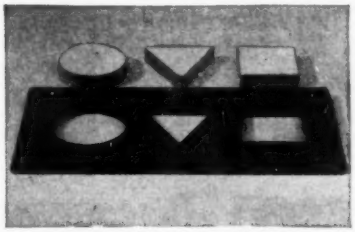
G. Cubes.

H. Cup and cubes.

I. Pellets and bottle.



J. Paper and crayon.



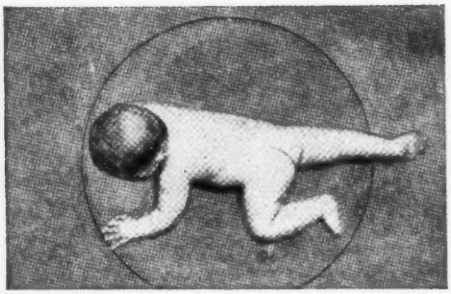
K. Formboard and blocks.

L. Performance box and square (facing child).

M. Puzzle box and ball (facing child).

Gesell: The First Five Years of Life (Harpers).

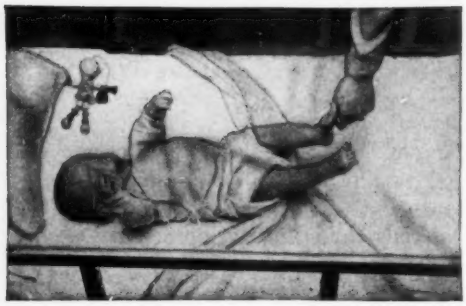
Examination Materials Used In Developmental Diagnosis



Motor

Adaptive

Language

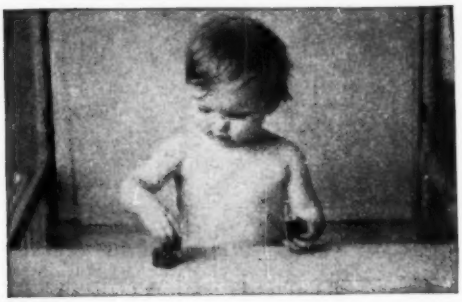


Personal-social

First Quarter: 16 Weeks

Second Quarter: 28 Weeks.

Motor



Adaptive

Language

Personal-social

Gesell: The First Five Years of Life (Harpers)

Third Quarter: 40 Weeks.

Fourth Quarter: 52 Weeks.

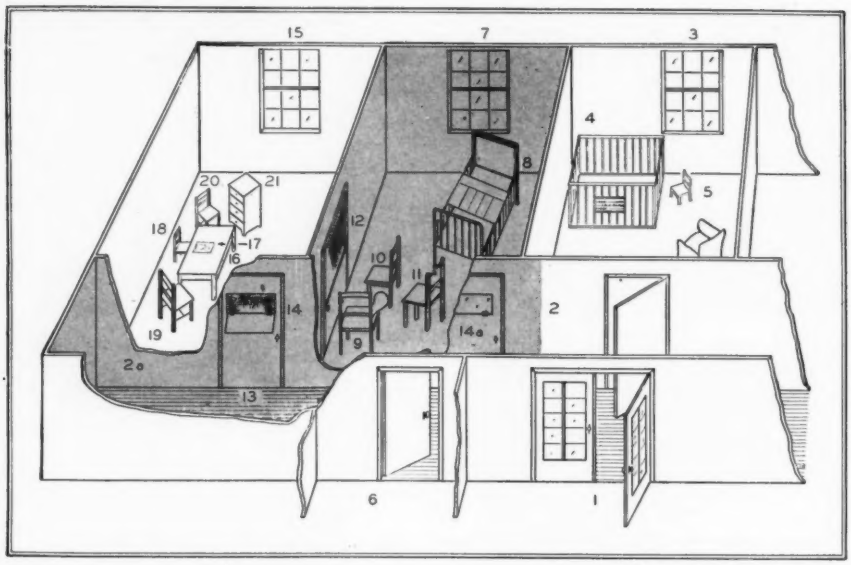


Diagram by Paul Hartmann

Diagram pictures a simple but effective setup for the developmental examination of infants and preschool children. The child enters at (1), passes through the hallway (2) which connects with the reception room (3) (and also with the bathroom at 6). The reception room is furnished with adult chairs and pen (4) and child's chair (5). The observation room (7) has been partially darkened by drawing the shade at the window. The recorder takes station in the chair equipped with writing arm (9). Observer is seated nearby, behind the one-way-vision screen panel (12) which communicates with the examination room (15) entered by the door at (13), equipped with one-way-vision window (14). The examination room is equipped with an examination table (16) showing the picture book (17) and child's chair (18) in position. The mother sits at the right (19); the Examiner at the left (20) with direct access to the examining cabinet (21).

By contrast, another 40-week-old subject demonstrates a retardation in postural behavior. He came to the clinic with a diagnosis of mental deficiency. This diagnosis was not accepted after the child's behavior patterns were examined through the developmental examination. The child showed atypical, abnormal behavior patterns—crude grasp, lethargic movement, with hyperflexion of the fingers and a leaden quality of movement. His inability to sit erect even in a supportive chair was suggestive of motor retardation. The patterns of pellet prehension were near the 28 weeks level.

The child's interest and sustained attention and drive, however, had a normal quality, and it was therefore concluded that he was suffering from a neurological deficiency limited chiefly to the motor mechanism and should not be diagnosed as an ament.

This is an example of selective, minimal birth injury which in favorable cases is more or less resolved by compensation and corrective adjustments. The clinic has followed this child through a period of years and found that the favorable prognosis was justified. The neurological defects remain with compensatory controls, however, and the child is making relatively normal progress in elementary schools.

A developmental examination of an infant does not consume much time; twenty minutes usually suffice. But the examination must be conducted systematically, formally, and with skilful adaptation of a standard technique. So conducted, the examination accomplishes four results:

1. It ascertains stages and degrees of maturity.

2. It analyzes the total behavior picture into

components, and makes possible differential diagnoses of normality, defect, and deviation.

3. It reveals neurologic defects and sensory handicaps, not disclosed by ordinary methods of clinical examination.

4. It supplies important objective information concerning the integration of behavior and the organization of personality.

Consider the innumerable clinical situations where a medical decision must be made, which involves all four of the factors just mentioned.

A foundling or a foster infant is offered for adoption. What is the developmental outlook of this infant? A developmental diagnosis alone can reduce the risks of adopting a baby.

An infant is prematurely born, perhaps with episodes of cyanosis and apnea. Will he develop normally? A diagnostic study of behavior will soon tell.

Another infant has suffered a birth injury. Was the injury slight or grave, is it selective or devastating? Should he have physiotherapy?

A preschool child is referred for tantrums and slow speech. The developmental examination reveals deafness, hitherto altogether unsuspected.

And so we might list an array of conditions in which development and disease simultaneously fall within the scope of clinical medicine: simple amentias, aplasias, malformations, degenerations, traumata, infections, anoxemia, erythroblastosis, endocrine dysfunctions, excessive emotional stress, environmental retardations, and pseudo-symptomatic syndromes.

All children, normal and abnormal, are continuously confronted with the universal problem of development—the problem of growing up. We cannot give adequate protection to these children, particularly in the first five years of life, unless we provide developmental diagnosis and developmental supervision at periodic stages of their growth career.

The untrained physician cannot make a conclusive developmental diagnosis. He can, however, be alert to the behavior symptoms of infants and young children in private practice, in his well-baby conferences, in child-health centers, and in child care agencies and institutions. At the lowest minimum there should be a routine *behavior inventory* which will screen significant defects and deviations. At the higher levels of medical organization, in hospitals and at teaching centers, there should be facilities expressly designed for the diagnostic study of complex cases of maldevelopment, and for the developmental supervision of handicapped infants throughout the whole preschool period.

These specialized facilities should have a separate locus, appropriate equipment and a trained personnel on a par with other diagnostic departments.

We have established specializing externeships in our clinic in which the externe devotes one or two years to the methods and procedures of developmental diagnosis on a full time service.

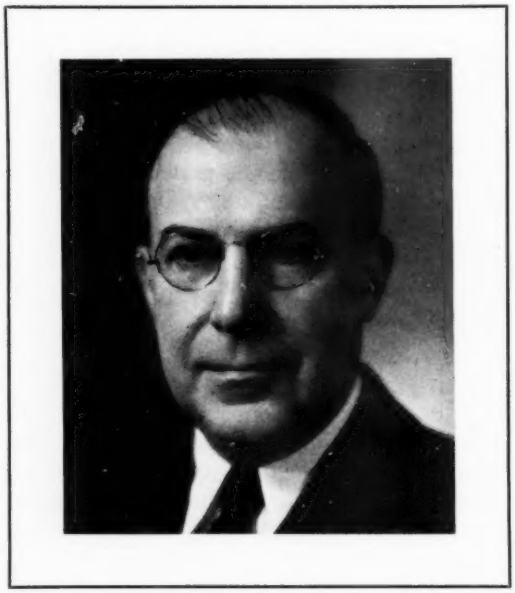
Developmental diagnosis is becoming a subspecialty in the domain of pediatrics. This is its logical orientation, since pediatrics is in itself a generalized form of medicine, which by tradition and necessity deals with the total child in his natural cultural setting. Neurology, orthopedics, and psychiatry also are concerned with children, but primarily from the standpoint of impaired or abnormal functioning. Child psychiatry, in so far as it represents a downward extension of adult psychiatry, lacks the concepts and methods which are essential for the developmental diagnosis and supervision of newborn and growing infants. Developmental pediatrics, in contrast, begins with birth and moves forward with the progression of the growth cycle.

Pediatric medicine is supervisory as well as diagnostic. It begins with the regulation of nutrition and physiologic well being, both of normal and abnormal babies. In view of new scientific advances, we may be certain that the somatic aspects of human growth will be brought under increasing control, together with undreamed of refinements of physical measurement and assay.

Organic Variability in Heart Disease

WILLIAM F. PETERSEN*

ST. LUKE'S HOSPITAL, CHICAGO



William F. Petersen

ABOUT forty of every hundred doctors die from some form of coronary disease; of these, the majority from coronary thrombosis. It may therefore be of interest to physicians to consider some of the common factors involved in the acute episode and to inquire whether there is anything that we doctors can do to avert this common fate.

I shall limit the discussion to coronary thrombosis and emphasize that coronary thrombosis may occur in a myocardium that reveals no vascular degeneration; and that thrombosis of the coronary vessels is favored when the current is sluggish, coagulation time accelerated, and the endothelium is unduly adhesive. This constellation follows a period when blood pressures have been higher, the current more rapid, the coagulation time slower, and the endothelium less adhesive.

The temperature zone in which we live is characterized by great variability in weather conditions and by a wide range and rapid changes in temperature. Such direct environmental factors become of great importance in conditioning the state of the organism. Of importance is the fact that the effect of weather may be cumulative particularly in spring and fall.

*Chairman, The Institute of Medicine of Chicago; Director of Clinical Research, St. Luke's Hospital.

Read before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

THE CLINICAL RECORD

Turning now to the clinical record, we find that coronary thrombosis is in fact characteristically seasonal, its highest incidence during

the periods of the year just mentioned, and, in addition, is weather-conditioned, occurring most often at temperature extremes—that is, during periods of unusually high or low temperatures, and most often after periods of cold.

Coolidge—Mr. Coolidge died suddenly on January 5, 1933. He was apparently in good health, though he had complained of hyperacidity for several days. Mr. Coolidge was allergic and poorly buffered; he tired easily and reacted markedly to any change in biotonus. Merely stepping onto a boat would make him seasick; cold weather promptly brought on a "sour stomach." The reason for the sour stomach that so frequently bothered him was simple. With the passage of each cold air mass we are apt to have a relative anoxia in large areas of the body as a result of vasospasm. This in turn leads to the compensatory production of capillary active substances such as histamine, more carbon dioxide, etc. The histamine acts on the stomach mucosa, thereby producing more hydrochloric acid. At these times, Mr. Coolidge would take soda, as do many others under similar circumstances.

Keeping this in mind when we study the temperature at the time, we note first a severe cold wave that sent temperatures down 60° F. in a day. Consider for a moment what this would do to the vascular system of a sensitive organism such as that of the former President. The peripheral vascular bed would contract maximally (insulation) and the pressures would rise abruptly. The load on the heart would be greatly amplified.

Then the reversal would follow along with capillary active substances being formed in the regions which had been anoxic. The capillaries would dilate; acid production would reach a peak; the vessel walls would be sticky; coagulation would be enhanced; and blood pressure would fall.

Then the environmental temperatures rose just as abruptly as they had fallen a few days before. Such an increase in the temperature would be followed by peripheral dilatation of the vessels, and this, too, would lower blood pressure. We would then have two similar trends, the one amplifying the other: (a) the biological after-effect of correction or even overcorrection of the preceding cold wave, and (b) the normal effect of the warm wave. The result—very low blood pressures, unduly sticky vessels, shortened coagulation time, and blood concentration. With that state could come sudden clotting in any area actually or potentially inadequate, such as the coronary and cerebral regions and occasionally in the extremities.

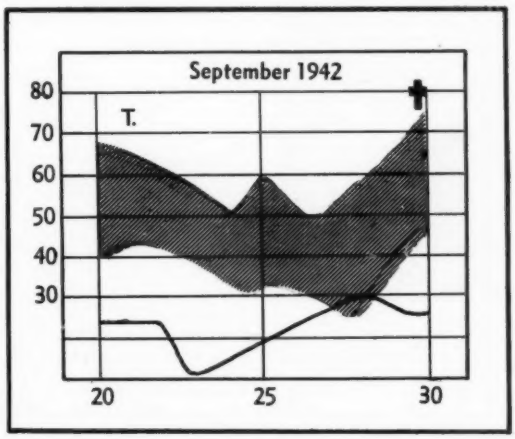


Fig. 1. Meteorogram with daily maximal and minimal temperature for Minneapolis, September 20-30, 1942. Death of Dr. Gortner occurred on the 30th.

F. D. Roosevelt—Mr. Roosevelt reportedly had a very severe cerebral episode at Hyde Park, New York, on March 25, 1945, and was hurried to Warm Springs, Georgia. The final blow came on April 12. An examination of the weather record shows that at Hyde Park, the temperature had reached the eighties in mid-March and declined sharply to freezing levels by the twenty-second. Then came an upswing with an occluded front (i.e., temperatures up and barometric pressures also increasing) and under these weather conditions, Mr. Roosevelt experienced a serious cerebral accident, a "stroke."

At Warm Springs there was a related situa-

tion. It was almost freezing on the seventh of April; then an upswing of 40° F. and, with this, the terminal episode. Thrombosis, followed by rupture and hemorrhage, was probably the immediate cause, but since we do no postmortems on our presidents, we cannot be absolutely certain.

Gortner-Palmer—On September 1, 1942, Dr. Ross A. Gortner, well-known Minnesota chemist, wrote me, and made one or two statements which I think are of interest. "I have always contended that a single determination of a blood analytical value is relatively meaningless, since observations in our own laboratory have indicated wide variations from day to day. Most of our observations have been made on the blood of animals and perhaps meteorological conditions are the reason for some of the variations we have observed and which we could not otherwise explain. We have noted major fluctuations in blood phosphorus in dairy cattle on a uniform diet and under as nearly controlled conditions as we were able to maintain. Perhaps this is one of the reasons for my feeling so exhausted on certain days when I think I should be more normal. Ever since I had a coronary thrombosis, high humidity and extreme cold both markedly lower my ability to walk or make any physical exertion."

Dr. Ross Aiken Gortner, 1885-1942.

Dr. Gortner died twenty-nine days later. When we examine the temperature record for Minneapolis, we observe that a sharp decline in temperature had occurred after the twentieth, reaching a low on the twenty-seventh; then the temperature rose rapidly to a crest on the thirtieth.

Dr. Gortner was succeeded as chief of the division of agricultural biochemistry of the University of Minnesota by his associate, Dr. Palmer. On February 25, 1944, Dr. Palmer had a sudden coronary thrombosis and died on the ninth of March. The Minnesota temperature records indicate that a polar crest was reached on the eighteenth (—10° F.), followed by a rise of 55° F., and at the crest, thrombosis occurred. Death came when the succeeding zero wave increased the cardiac load on the damaged heart.

Edsall—We return to New England for a moment and to our own profession. In the *Journal of the American Medical Association* (V.128, No. 17) we find the obituary of the Dean of the Harvard Medical School, Dr. David Edsall. He died suddenly on August 12, four months after the death of Mr. Roosevelt. We find that the environmental picture was identical. It had been relatively cool early in the month; then came a sudden rise to almost 90° F. and with that, death! But when Edsall died, Hugh Cabot also died suddenly. Coincidence? No, merely inadequate adjustment to an environmental situation. Actually, death is always due to this, but the specific environmental condition may vary!

Bassoe-Bowen—We turn to Chicago; the month is November. An old friend and valued

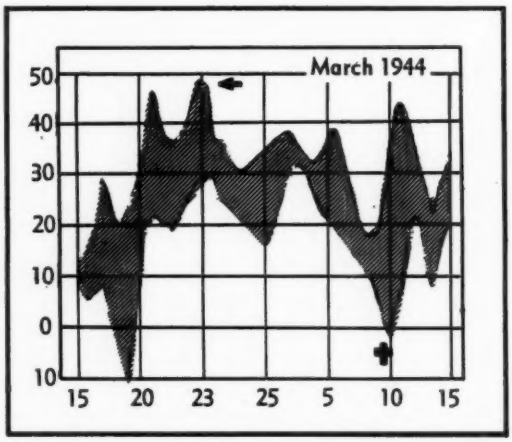


Fig. 2. Minneapolis temperatures associated with the coronary thrombosis, February 25, and death of Dr. Palmer, March 9, 1944.

colleague, Dr. Peter Bassoe, died on the fifth of the month from a sudden coronary thrombosis. He had had a previous attack some years before but had made a satisfactory recovery and had continued in practice, though with some restriction of activity. The meteorogram shows a great temperature decline from over 70° F. to the low 20's. Early in November Dr. Bassoe experienced prostatic difficulty(smooth muscle is shortened with periods of cold and obstructive symptoms are apt to become more pronounced) and entered Presbyterian Hospital for surgical relief. On the following day he died from a coronary thrombosis.

Another friend, but a much younger man, Dr. Bowen of Houston, Texas, was then in Chicago attending a meeting of the College of Allergists. During the same environmental conditions that had terminated the life of Bassoe, Bowen suffered a severe coronary attack. Fortunately he made a good recovery.

Herrick's first case—Inasmuch as Herrick of Chicago was the first to recognize the clinical picture and the first to realize the importance of the clinical entity that we associate with coronary thrombosis, it is of interest to study his first case in relation to the weather of the time. Again we find a characteristic picture. A severe

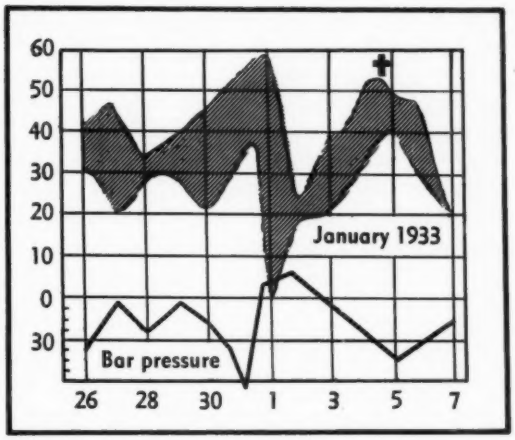


Fig. 3. Environmental temperatures associated with the sudden death of Calvin Coolidge, January 5, 1933.

cold wave had sent the temperature below zero and this had lasted a week; then the rise and with its crest, a coronary attack.

Heninger and Dickens—We can, as a matter of fact, select any case record at random and, with a few exceptions, observe this association of a characteristic environmental pattern and the acute attack of thrombosis. But I would stress that, while the organic state associated with and following temperature swings of the

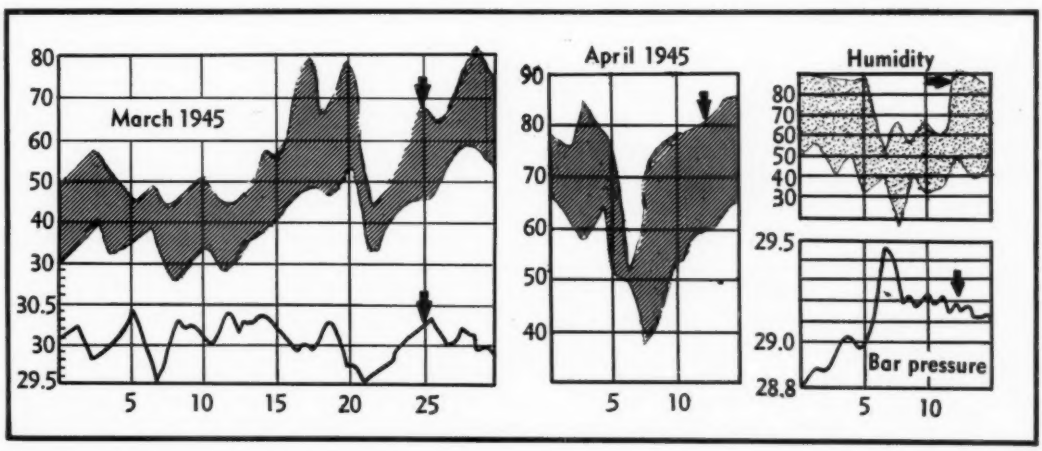


Fig. 4. Meteorograms to illustrate the weather at the time of the cerebral episode of March 25th and the death of President Roosevelt at Warm Springs on April 12, 1945.

type I have here illustrated is of major importance in most cases, other impacts, physical as well as mental, must not be disregarded. Such impacts frequently cause violent alterations of the organic balance, with a marked sympathicotonia that may be followed by an equally great reversal in biological mechanisms concerned —chemical, endocrine, nervous, physical, etc. Depression from grief or worry, irritation and anger, exertion and fatigue; digestive overload; no abdominal distension. The following morning he suffered severe precordial pain radiating to the shoulder and down both arms to the fingers.[2] He was very restless and his respirations were somewhat rapid and labored. The pain was so severe that ¼ grain of morphine was given; this was repeated in a half hour, with some relief. His temperature was 99° F. the night before admission. The patient had had a similar attack 25 years previously. He

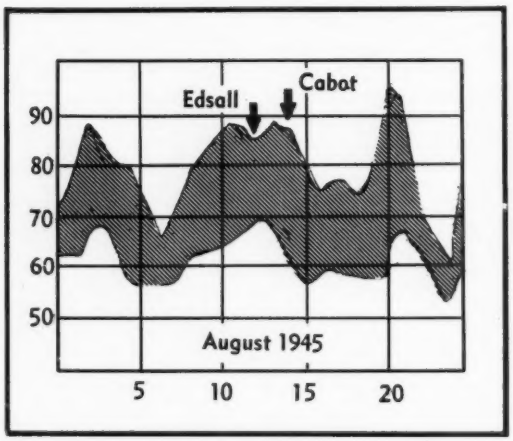


Fig. 5. Meteorogram to illustrate the environmental temperatures (daily maximal and minimal) associated with the coronary episodes in Drs. Edsall and Cabot.

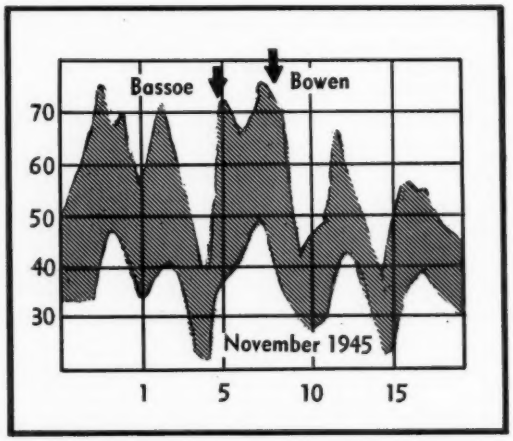


Fig. 6. Meteorogram to illustrate the environmental temperatures associated with the coronary episodes in Drs. Bassoe and Bowen.

infection and intoxication—all these must be kept in mind in the clinical observation and control of the patient.

Heninger and Dickens have published a case record that will serve our purpose. (Reference numbers correspond to numbers in meteorogram.)

"The patient, C. R., white male, aged 56 years, was admitted to the Touro Infirmary, March 22, 1937, 5 A. M., in a stuporous condition.[3] The history was obtained from his wife and family physician. The chief complaint was precordial pain. Four days previous to admission, the patient consulted his physician complaining of gas on the stomach. His blood pressure was 130 systolic and 70 diastolic; there was gave no history of venereal disease.

"Physical examination: Blood pressure was 60 systolic and 40 diastolic; pulse 70 and irregular. The pupils were contracted. Breathing was rapid and irregular. The tongue was coated; head, neck, lungs and abdomen were negative. The heart sounds were distant and irregular; no murmurs were heard. There was slight cyanosis of the fingernails.

"Course: An electrocardiogram was taken on admission revealing complete heart block. Caffein sodium benzoate gr. 7½ and morphia gr. ¼ were given one hour later. At 9:30 A. M. the patient became cyanotic and was cold and clammy. Pulse was not felt. Heart beat could not be heard. Temperature was 102° F.

The patient died five hours after admission.'"

The meteorogram for New Orleans illustrates the characteristic situation: first, a cold wave with a 40° drop in temperature, then the upswing and with it, thrombosis. [1, 2] The myocardium was badly damaged as a result. Three days later another cold wave and, with this, greater arterial pressure and greater intracardiac pressure. Then, death on March 22. [3, 4]

A PSYCHOSOMATIC INTERPRETATION

While I would not for a moment deny the integration of the psyche and the soma and indeed have for many years stressed the need of considering all factors in the total clinical picture if we would understand medicine, I do on occasion become a bit annoyed at the carry-over of the verbal refuse of the psychoanalytical epoch into a field that should be wholly freed from this blight. Psychosomatic medicine should not be another specialty; it should be common property of every real physician, but it certainly is not heading in that direction at the present time. For instance, here is Dunbar's formulation of the coronary case:

"They have a general air of self-sufficiency and tend to dominate in social relationships through superior argumentative skill. They rarely allow themselves freedom in emotional expression but talk readily about themselves and describe their own feelings insofar as they can find some respectable formula or predecessor for them through Schopenhauer or the Bible.

"Accepting the idea of hierarchy, they identify themselves with authority figures and strive to become superauthorities. Unlike the hypertensive, they make up their minds quickly because they have a definite frame of reference in their long-range goal. The resemblance to the fracture patient is only superficial because a fracture patient's decisiveness is based upon a response to immediate values.

"The coronary accident in these patients is precipitated by an apparently irreparable mutilation of their picture of themselves because of external threats to their authoritative role.

"Their initial reaction to illness is despair combined with a compulsive need to deny any need for change in their pattern of living, hence their tendency to overdo and disobey instructions or to develop extreme depression.

"This personality constellation plays an important role in bringing about the coronary accident and has a bearing on prognosis and therapeutic management. In the typical extratensive coronary patient, the prognosis will be relatively poor unless some appeal can be made to his creative impulses. Emphasis should be laid on a creative outlet still open to them without accentuation of the necessary curtailment of their usual activities."

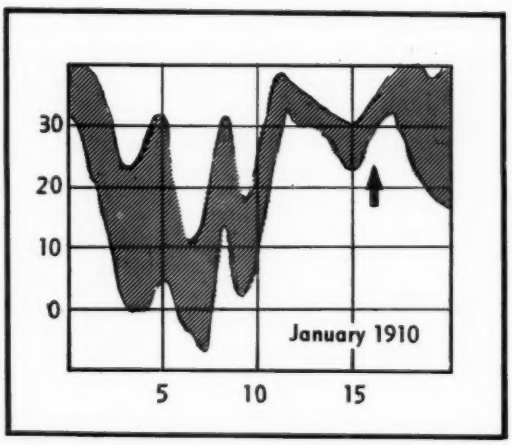


Fig. 7. Chicago environmental temperatures, January 1910, to illustrate Herrick's case No. 1. Arrow points to date of coronary thrombosis.

THE VASCULAR REACTION

Now let us keep to the simple facts. In Fig. 9 I have sketched the changing blood distribution, or blood balance, that is of basic importance for our consideration and for the understanding of many clinical conditions.

The figure in the center represents the normal equilibrium of the blood distribution. The effect of cold is illustrated at the left (insulation-sympathicotonia). At the right we have peripheral dilatation i.e., radiation with, in general, lowered pressures.

A schematic illustration—We can illustrate

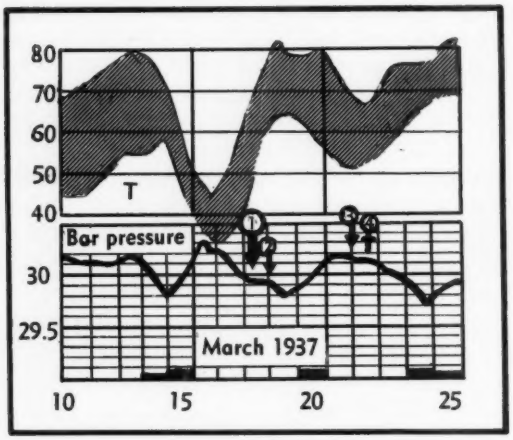


Fig. 8. Meteorogram for the period in March 1937 (New Orleans) associated with the coronary episode in the case of Drs. Heninger and Dickens.

this organic rhythm very simply if we merely diagram blood pressure levels, as in Fig. 10. At the arrow, an energy impact occurs—it may be a cold wave, an emotional upset, exertion, infection, or an allergen. A sympathicotonia follows—vessels constrict, pressures rise; it is an "alert" or "adrenal" phase, if you so wish to designate it. Selye termed it the "alarm reaction."

If at this time the skin is tested, flares are negligible; there is greater resistance to infection; cells are temporarily less permeable. A relative alkalosis and hyperglycemia exist, together with an increase in blood pressure.

This adrenal or "stop" phase changes to the "go" phase—vessels dilate; there is relative acidity; cells become more permeable; they are less resistant to injury; skin flares are exaggerated.

All this is very simple. Assume now that we must equilibrate two such impacts in rapid succession (1 and 2 in the central diagram). Then the pressor level will be higher and also lower, and if later (2) another factor, such as undue heat, supervenes, the pressure may fall to unusually low levels. Or, if with seasonal accentuation, a series of impacts supervene in rapid succession, we will face the situation in the third diagram, with periods of great pressure crests and depressions in close sequence.

What has been illustrated here for blood pressure holds for every component in the complex series of organic balances.

This blood balance is normally well maintained; but if an autonomically unstable individual or a dysplastic or a sick individual, is placed in an unstable environment (i.e., the storm track area of North America) it will be found that there is a constant pendulation of vasomotor, endocrine, and chemical balances that may reach amazing amplitudes. In Fig. 11 I have charted the day-by-day blood pressure curve of such a patient when observed from May, 1934, to the following May, 1935. The seasonal trends are well defined, (S) reflecting the summer decline, (A) the autumnal crest (relative alkalosis), and (J) the decline of fatigue after the winter crest and its associated anoxia. A period such as this would obviously increase the hazard of thrombosis.

Obviously coronary thrombosis can occur at any time; but during periods of seasonal transition, when we change from winter to spring or from summer to autumn, the opportunity will be enhanced for the simple reason that the

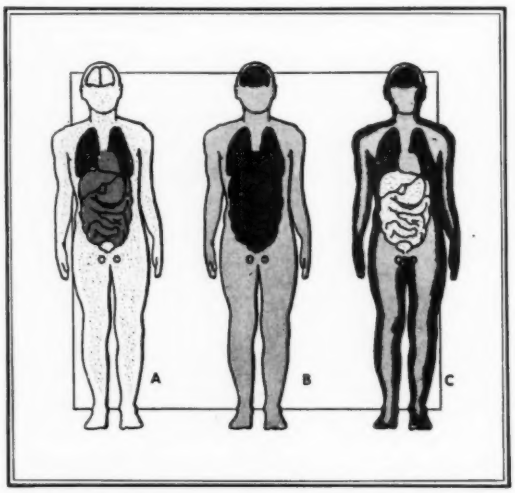


Fig. 9. Diagram illustrating blood distribution with opposite environmental situations: (A) normal balance, (B) cold, (C) warmth.

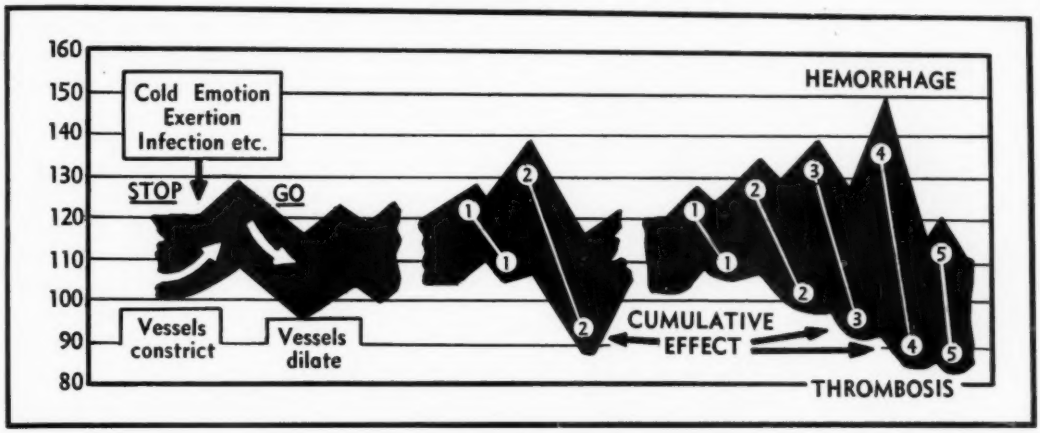


Fig. 10.

autonomic tone is subjected to greater strain.

In broad terms, coronary inadequacy and the final picture of coronary thrombosis merely reflect undue environmental demands on circulatory adjustment. Irrespective of the nature of the environmental demand—heat or cold, work or excitement, digestive overload, or the innumerable impacts which we have to meet—the basic mechanism is identical, modified of course by pre-existing changes in the coronary circuit, kind of person, age, sex, habitus, and familial background.

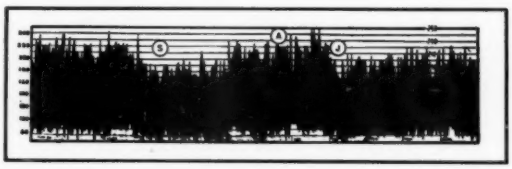


Fig. 11. Daily systolic and diastolic blood pressure readings, May, 1934, to May, 1945.

But of all the factors and impacts to which the circulatory mechanisms must adjust, for us, living in a region of great meteorological variability, weather is for practical purposes the most important. In maintaining its heat balance most tenaciously, the organism must rely mainly on the circulatory system to shunt the blood to and fro in the major blood beds. As long as we must adjust to violent shifts in the air mass in which we exist, we will tax the vasomotor mechanisms to the limit and in so doing it will be inevitable that coronary dysfunction and coronary thrombosis will occur. In closing I would like to have you keep in mind the statement of Hippocrates, the world's first great physician, "So in one place it stops (i.e. the blood), in another it passes sluggishly, in another more quickly. The progress of the blood through the body proving irregular, all kinds of irregularities occur."

Treatment of the Disorders of Speech

JAMES S. GREENE*

NATIONAL HOSPITAL FOR SPEECH DISORDERS, NEW YORK CITY

WE HEAR a great deal in these postwar days about rehabilitation, and rightly so. But we associate the word primarily with the physically ill, with those who have lost an arm or leg, or are blind or deafened. Seldom do we associate it with speech and voice sufferers, although they probably constitute the largest single group in need of rehabilitation today.

It is conservatively estimated that there are over ten million men, women, and children in this country who have some type of speech disorder or voice abnormality. Until recently, these people have been sadly neglected by the medical profession—because the physician, when he came in contact with them, was aware only that they did not speak correctly and tacitly assumed that the solution to the problem was simply a matter of reeducation, and hence outside his domain. What he did not understand, and what I wish to stress in this article, is that a speech or voice disorder rarely develops as an isolated phenomenon but, in the vast majority of cases, is a peripheral manifestation of some underlying psychic or somatic involvement.

The acquisition and subsequent retention of normal speech are contingent on many factors: a normal peripheral mechanism, which, of course, includes the breathing apparatus; adequate hearing; the necessary degree of intelligence; the integrity of the cerebral areas and nervous connections concerned with speech; and an environment conducive to the development of normal speech. Also, there is the vital factor of the emotions. Finally, the endocrine glands should be mentioned, for they not only influence the emotions but in some cases directly affect the development and functioning of the speech organs themselves, particularly the larynx.

Obviously, an abnormality of any of these factors, faculties, and mechanisms concerned in the development and execution of speech, will affect that function, and it naturally follows that the speech and voice specialist is confronted with a multiplicity of syndromes. In the interest of simplification, we usually consider them under five major categories: *dysphemia,* or stuttering; *dyslalia,* or defects of articulation due to faulty habit, environmental factors, mental retardation, or abnormalities of the peripheral mechanisms concerned with the acquisition and execution of speech; *dysarthria,* or articulatory defects due to neurological involvements; *dysphasia,* or language disorders, due to involvements of the language areas of the cerebrum; and *dysphonia,* or voice disorders.

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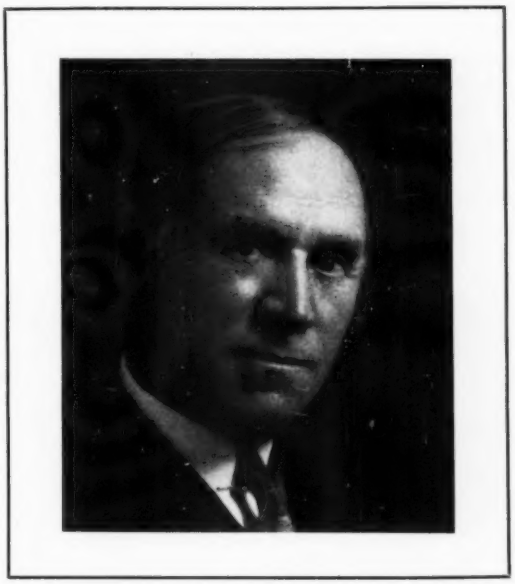
DYSPHEMIA

Stutterers undoubtedly comprise the largest single group of speech and voice sufferers. Dysphemia, or stuttering, is a disorder charac-

terized by repetitions, blockages, or other interruptions in the flow of speech—and is often characterized also by adventitious movements, such as tics or twitches, especially of the face. It is a psychosomatic condition, for the speech disturbance itself is the symptom of a far-reaching personality disorder. It begins typically in early childhood, and there are many conflicting theories regarding its etiology, their fundamental theses depending upon the orientation in medicine, psychology, or education of their respective proponents. Evidence, however, strongly suggests that the disorder is based on a constitutional predisposition to emotional imbalance in general and to stuttering speech in particular. This constitutional susceptibility—which, incidentally, appears to be on an hereditary basis, since approximately 65 per cent of patients give a family history of stuttering—does not in itself cause the disorder: The speech disturbance appears to be precipitated by emotional shock which may result from an accident, a fright, some radical change in the environment, the advent of a younger child into the family, or the accumulated impacts of a neurotic home environment.

The child who is predisposed to stuttering in most cases demonstrates, even before the onset of the speech symptom, a tendency toward excitability and exaggerated response to stimuli. Soon after the appearance of the stuttering symptom he begins to realize that he is "different" from other children and develops a keen sense of inadequacy, particularly if parents lay undue stress on his poor speech. As he begins to pay the penalties attached to stuttering, his feelings of inadequacy are intensified and give rise, in turn, to morbid anxiety—the child anticipating speech failures and the failures, when they inevitably occur, increasing his anxiety. He is caught in a cycle which eventually leads to the development of a neurosis that warps the entire personality.

For therapeutic purposes, we distinguish two phases of stuttering: the primary stage, before the child has become acutely aware of his disorder; and the secondary phase, when he has developed anxiety symptoms and other characteristic personality deviations.



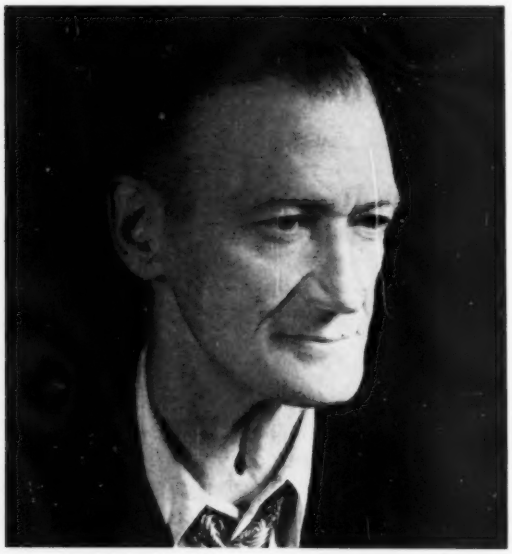
James S. Greene

THERAPY in the initial phase of the disorder is essentially a matter of eliminating environmental stress and of helping the child to overcome his disorganization through a regimen of rest, relaxation, and "slow-easy" activity.

It is the secondary phase of the disorder which presents the major therapeutic problem, since at this stage we are dealing with a full-fledged neurosis. The goal of treatment is essentially to break down old, unsound emotional reactions, habit patterns, and attitudes, and to replace them with healthy, constructive new ones—in other words, to build a more mature, more adequate, and more stable personality. This demands a multiple treatment embracing medical, social, psychiatric, and reeducational procedures. Major emphasis, however, is on group psychotherapy. This is because the adult stutterer suffers from a social neurosis—*i.e.*, it is the social setting, the introduction of others into the milieu, which brings the speech disorder to the fore—and group therapy gives

him an opportunity to "act against" his anxiety and his speech symptom in the type of environment which ordinarily elicits them.

The new patient is placed in what might be termed a low-pressure group, in which the seemingly hostile aspects of the outside world which constitute such mental hazards for the stutterer have been for the most part removed.



Patient who has undergone laryngectomy showing opening into the trachea.

As he adjusts to the group milieu, he progresses to more advanced groups. The environment is so devised as to submit him to a gradual increase in environmental pressure in proportion to his growing ability to withstand it. Group therapy is supplemented by individual interviews, the amount of individual work depending upon the specific needs of the patient, and by such supportive group measures as club activities, dramatics, and dancing.

DYSLALIA

The dyslalias, the second major category of speech defects, include delayed speech, lisping, cleft-palate speech, and all defects of articulation other than those due to neurological conditions.

The dyslalias are in general of less concern to the physician than the other types of speech and voice disorders because treatment is largely a matter of speech training and, except for those cases in which organic abnormalities are responsible for the speech defect, is principally the concern of the speech teacher or clinician.

Among the organic abnormalities which affect articulation are various defects of the tongue, although such conditions have a less serious influence on the speech function than might be supposed. Despite the fact that the tongue is popularly considered the principal organ of speech, it can be completely extirpated without greatly impairing speech production.

Clefts of the lip and palate, especially of the latter, have much more serious effects on speech. There are, of course, various types of clefts, some being confined to the hard or soft palate alone and some extending completely through both palates and through the lip. Regardless of type, almost every cleft of the palate has a marked influence on speech, the most noticeable effect being the unpleasant nasality which results from the uncontrolled escape of air into the nasal chambers. This is one of the most difficult defects to eradicate.

Whenever feasible, a cleft of the palate should be closed by surgical measures, and the physician should make every effort to repair the palate in such a way as to insure its best possible functioning for the production of speech. I emphasize this point because the novice in operating occasionally fails to take into consideration the effects on the speech function of cicatricial tissue contraction. The scar tissue in healing tends to contract, thereby restricting the mobility of the palate and almost inevitably foreshortening it and leaving a wide postnasal space. The larger this space, the more difficult it is for the patient to control the escape of air into the nasal cavity, and hence the more pronounced his nasality.

When it is impossible to close the cleft by surgery, the only alternative, of course, is to fit

the patient with an obturator in order to effect closure. However, regardless of whether the cleft is closed surgically or by mechanical means, in almost every case the patient requires speech training. Such training should begin as early in life as possible.

DYSARTHRIA

The dysarthrias are also defects of articulation, but they are defects due to central nervous system involvements which affect the innervation and coordination of the speech musculature. Pathological changes at any one of a number of sites may result in dysarthria. For example, lesions of the lower motor neurones that directly innervate the peripheral muscles of speech—the seventh, ninth, eleventh, and twelfth nerves—will cause a partial or complete paralysis of the parts subserved by the affected neurones, with a resultant articulatory disturbance. Similarly, lesions in the cerebellum or injury to the cortical neurones of the speech areas and the corpus striatum will also cause dysarthria.

The symptomatology varies, depending to a great extent upon the site of the lesion. Speech may be completely absent, as in the case of a bilateral paralysis of the vocal cords; it may be nasal, as in the case of paralysis of the palate following poliomyelitis or diphtheria; it may be labored, scanning, and monotonous; or it may be muffled and indistinct. Often it is hesitant, jerky, and tremulous, and the patient may have particular difficulty with sounds which require intricate muscular coordination. Anxiety usually increases the severity of the disturbance. In some instances, notably in many cases of spastic paralysis, speech may be accompanied by grimaces and various extraneous bodily movements.

Prognosis depends upon the site, severity, and nature of the pathologic changes and upon whether or not these changes are progressive. If the disease process is not progressive and if the patient is mentally alert and cooperative, speech training and muscular reeducation will usually bring about varying degrees of improvement. Specific remedial procedures must be adapted to the individual case, but the general therapeutic program should embody relaxation exercises, training in muscular coordination and control, breathing exercises, and voice and speech training suited to the individual needs of the patient.

DYSPHASIA

The dysphasias (aphasias) are language disorders resulting from disease processes, injuries, or other involvements of the language areas of the cerebrum which affect the comprehension and use of the symbols of speech. Occasionally these involvements are congenital. More often they are acquired through trauma, embolism, brain tumor, encephalitis, meningitis, degenerative brain diseases, or similar pathologic processes. Frequently dysphasia is one of the sequelae of cerebral hemorrhage when the damage is in the left hemisphere—the hemisphere in which the dominant speech center is normally situated. At present, we are seeing a number of cases of dysphasia which resulted from head wounds sustained in the war.

Three types of dysphasia are usually distinguished: motor, sensory, and mixed. The patient with motor dysphasia, while understanding spoken language, has difficulty in expressing himself. He cannot evoke the right words or, in some cases, cannot evoke the memory of the coordinated movements necessary to produce them. He may be completely bereft of all speech, or he may simply be unable to recall certain words. Occasionally he has difficulty with certain types of words—verbs, for example—or with sentence construction. The patient with sensory aphasia suffers from a disturbance in the perception and understanding of spoken language. Usually he has an intact vocabulary, but a vocabulary whose meaning has been lost to him. Thus, although he usually is able to speak fluently, his conversation is a jargon. The patient with mixed dysphasia presents symptoms of both the motor and sensory types. The "pure" forms of the disorder are rare, the mixed type being most frequently encountered.

Group psychotherapy of stutterers.

Occasionally there is a spontaneous partial or complete recovery from the dysphasia as the acute stage of the pathologic process subsides. When there is no spontaneous recovery of the speech function, or when recovery is incomplete, speech reeducation is indicated. The aim of such reeducation is to build up a new set of associations between words and the ideas and objects for which they are symbols. Since the symptomatology of dysphasia varies, specific remedial procedures must be adapted to the individual case.

DYSPHONIA

The dysphonias, the last major category of speech and voice conditions, are defects or disorders of phonation. Perhaps the most prevalent of these disorders is trachyphonia, hoarseness, a condition which should never be dismissed lightly since it is often the first and only early symptom of cancer of the larynx.

Psychophonasthenia—One of the most interesting of the dysphonias is psychophonasthenia, a condition which develops in late adolescence or in adulthood and most frequently afflicts men and women in professional life. The voice is strained and tremulous and "cracks" frequently, sometimes choking off completely. The disorder is often attributed to fatigue or voice strain and diagnosed as phonasthenia. The physician is often aided and abetted in making this diagnosis by the patient who, anxious to "legitimatize" his disorder, will usually give a history of laryngitis, respiratory illness, or vocal strain in an effort to establish the organic plausibility of his symptom. However, the disorder is one of psychic origin—a symptom of neurotic anxiety that has been physiologized in the vocal tract—and for that reason I have termed it psychophonasthenia.

Psychophonasthenia appears to be the expression of a personality with a great deal of aggression that has been suppressed and has turned inward. Although usually above average in intelligence, the patient is emotionally immature and unstable and gives evidence of being extremely inhibited, tense, and anxious. The case history will usually reveal that these characteristics were well marked before the appearance of the voice disorder itself, suggesting that psychophonasthenia is the culmination of a neurosis which has been developing over a period of many years. Since the underlying conflicts are deep-rooted, treatment must usually be prolonged. Both group and individual psycho-

therapy are indicated, and it is often necessary also to introduce a certain amount of voice training in order to correct bad vocal habits resulting from the constant misuse of the laryngeal muscles.

Falsetto voice—Falsetto voice is another type of dysphonia which the physician occasionally encounters. It is an abnormally high, shrill voice in the male, and is occasionally associated with a glandular involvement, although this is less often so than is popularly supposed. In the majority of cases that I have seen, the voice disorder appears to have developed initially because of hypersensitivity during the pubescent period. The patient with a falsetto voice typically gives a history of having been a shy, sensitive, somewhat neurotic child. Such a child is more than ordinarily embarrassed by the somatic changes of pubescence, and especially by the voice change which gives to the world objective evidence of his approaching maturity. In his embarrassment and his state of uncertainty, he strives to cling to the security of childhood a little longer and unconsciously inhibits the voice change. Through continued misuse of the laryngeal muscles, the levators remain in dominance, keeping the larynx high in the neck, and the childish treble becomes a permanent feature. The condition, if uncorrected, continues throughout the individual's entire life; and since a certain stigma is attached to the disorder by virtue of the fact that a high, feminine voice is characteristic of the eunuch and eunuchoid, the man with a falsetto voice is usually subjected to many traumatizing experiences which increase his sensitivity and aggravate his neurotic tendencies.

Of course, in certain instances there is an endocrine involvement. In such cases the voice disorder is but one aspect of the whole symptom complex, and it is comparatively easy for the diagnostician to recognize the endocrine type merely by observation of the picture which the patient presents. He usually shows a quite apparent deviation from the so-called morphologic normal. For instance, he may present a picture of general under-development. On the other hand, he may present the typical Fröhlich syndrome, with its characteristic female distribution of fat around the hips and breasts, large abdomen, and under-developed genitalia. Or he may be an elongated eunuchoid type; while such a patient is altogether different from the Fröhlich type, it is nevertheless readily apparent that he is atypical.

In general, prognosis is favorable in cases of falsetto voice. The larynx can usually be lowered through manipulation so that the depressor muscles assume dominance. This dominance must be reinforced by voice training, and a period of psychotherapy may be indicated as a supplementary measure. In those cases in which there is a glandular involvement, endocrine therapy may also be indicated.

Aphonia following laryngectomy—A number of voice disorders are due to iatrogenic defects—defects which result from measures instituted for therapeutic purposes. The most far-reaching in its influence on the voice and in its total effect on the patient is the extirpation of the larynx.

LARYNGECTOMY is usually performed, of course, because of cancer of the larynx. Since the larynx is an integral part of the respiratory apparatus, its extirpation removes a section of the normal air passage; thus the patient no longer breathes through his nose and mouth, but through the opening in his neck to which the trachea has been sutured. Laryngectomy thus robs the patient of the two essentials for producing voice in the normal manner: (1) a mechanism capable of vibrating (the vocal cords); and (2) a moving column of air flowing past the vibratory mechanism and through the mouth.

Fortunately, however, it is possible to teach a patient who has lost his larynx to develop a substitute voice by swallowing air into the esophagus and then slowly regurgitating it. Usually there is in the pharynx sufficient loose tissue to serve as a vibratory mechanism and thus to produce sound when air is expelled. The patient learns to articulate as he produces

the esophageal voice and gradually begins to talk again.

An esophageal voice is not as pleasant as a voice produced in the normal fashion, but it is adequate and enables the person to "carry on" socially and vocationally. To note the change in the patient's mental attitude and outlook on life when he finds it possible to speak again despite the loss of the larynx, is one of the major satisfactions to be derived from work in this complex field of speech and voice disorders.

CONCLUSION

In conclusion, I want to emphasize again the fact that speech and voice disorders seldom develop as isolated phenomena but, in the great majority of cases, are peripheral manifestations of some underlying psychic or somatic involvement. If the physician will keep this in mind, he will then ask himself, "What is the significance of this symptom?" The answer will often suggest the necessary therapeutic procedures.

The Bettmann Archive

Historical Epochs in Medicine: The first ovariotomy.

DIAGNOSTIC CLINIC

Diseases of the Thyroid

GEORGE CRILE, Jr.

THE CLEVELAND CLINIC, CLEVELAND

FIVE YEARS ago thyroidectomy was accepted as the treatment of choice for hyperthyroidism. Today medical treatment with the recently developed anti-thyroid drugs can safely, completely, and in some cases perhaps permanently, control hyperthyroidism, and it is rapidly gaining favor as a definitive treatment for certain types of hyperthyroidism.

The controversy at the moment centers about what types of hyperthyroidism should be treated medically and what types surgically. It is much too early to draw final conclusions as to the long-range efficacy of the anti-thyroid drugs of the thiouracil series, and it would be unwise to attempt to make unqualified evaluations of definitive medical treatment. Nevertheless, it appears that thyroidectomy is no longer the treatment of choice for all diffuse goiters with hyperthyroidism. I am referring now to Graves' disease and am distinctly *not* referring to adenomatous goiter with hyperthyroidism or the so-called toxic adenoma. It is in Graves' disease, exophthalmic goiter, or diffuse goiter with hyperthyroidism, whichever you call it, that we now believe medical treatment is the initial treatment of choice, and we believe that in many cases hyperthyroidism can be controlled by the use of the new and relatively nontoxic propyl thiouracil with lower mortality, with less morbidity, and with greater economy than with thyroidectomy.

Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

Thiouracil proved far too toxic for general use. The mortality associated with its use was comparable to that of thyroidectomy in good hands. This toxicity and the natural concern which was expressed by both doctor and patient while under treatment with thiouracil led to a prejudice against the anti-thyroid drugs, a prejudice which has been perhaps wrongly carried over and applied to the newer and less toxic drugs in this series.

Propyl thiouracil to date has proved both safe and effective. It is difficult to estimate how many patients throughout the country have been treated with this drug, but it must now be close to a thousand, and so far as is known at the present time there has been no mortality following its use. There has been only one reported case of agranulocytosis, and this, as I understand, occurred in a patient who had had two previous episodes of the same condition prior to the time she began to take the drug.

We have felt, in using propyl thiouracil, that its toxicity is sufficiently low that it is not necessary to do the weekly or bi-weekly white blood count or to keep the patients hospitalized or under close observation. We merely warn them to report at once any fever, dermatitis, or sore throat which they develop, or any feelings of malaise. We feel this is sufficient, and so far in over 120 patients definitively treated with propyl thiouracil we have had no cause for regret, because we have had only one patient who has developed even a granulopenia. I will present that patient a little later this morning.

We check the basal metabolic rate in four to six weeks, sometimes letting it go as long as eight weeks if it is inconvenient for the patient to come in. These patients continue to work if they are not incapacitated by the disease, and within three or at most four months complete control of the hyperthyroidism is almost always apparent.

Propyl thiouracil accomplishes essentially a physiologic rather than an anatomic thyroidectomy. The hyperthyroidism is completely controlled and patients feel completely relieved of their symptoms and entirely well when the disease has been controlled with propyl thiouracil.

The important thing is not to do as we did with thiouracil, that is, merely to give the drug until the metabolism reaches normal and then discontinue its use, but to maintain that remission by continuing the drug for anywhere from six months to a year. If we do that, we do much the same thing as we do with an anatomic thyroidectomy—we break the vicious circle of neuro-endocrine disorders, whatever they may be, responsible for hyperthyroidism.

Thyroidectomy itself does not remove the underlying cause of hyperthyroidism. Few believe that diffuse goiter with hyperthyroidism, Graves' disease, is primary in the thyroid. It is a widespread disorder of the neuroglandular mechanism and expresses itself by hyperthyroidism. For some reason, when the major portion of the thyroid is removed a remission is induced; when that remission occurs the vicious circle is broken and the disease spontaneously subsides.

Our aim with these drugs is to maintain a complete remission of the hyperthyroidism for as long as a year. Of course, it is impossible to predict what the final number of permanent remissions will be, but we have reason to believe that long-standing remissions will occur in enough of the patients so treated to make it worth while.

I have some patients this morning whom I want to present who illustrate some of the indications for treatment with the anti-thyroid drugs and also some of the difficulties which one experiences in these treatments, because, like any form of medication, it is not universally applicable to all people. Some people with diffuse goiter still are better handled with thyroidectomy.

THE FIRST patient, Mrs. H., whose husband is a physician in the audience this morning, had an acute Graves' disease when she came to us in April, 1946, and she has been definitively treated with propyl thiouracil. This acute hyperthyroidism came on after an automobile accident. There was the staring expression, exophthalmos, a pulse rate of 120, and her basal metabolic rate was +48 per cent. She had a diffuse goiter with hyperthyroidism. She was treated with 150 mg. of propyl thiouracil daily, and her basal metabolic rate fell from +48 to +25 in 16 days, in one month to +20, in seven weeks to +5, and during the five months that she has been under treatment it has remained within normal limits and is now +2 per cent.

She had a bruit over the thyroid which was

George Crile, Jr.

persisted to the present, but two weeks ago she was started on iodine and I believe that we will find that that is now gone. These usually subside promptly when iodine is given.

She has gained 11 pounds; her pulse rate is 72; the eye signs have gone; the gland is now smaller, and she feels essentially well.

The question with this patient is, should we now subject her to thyroidectomy? My feeling is no, because she has at least a 50-50 chance at present of remaining well following withdrawal of the drug, so why operate on a disease which may already be cured? If she will continue to take the propyl thiouracil, which does not bother her at all, for another period of six months her chances of obtaining a longstanding remission are probably further increased. She has shown no toxic signs and there is no reason to believe that she will.

Mrs. H., would you come forward, please, to the microphone? I would like to ask you how you feel at the present time as compared with before your illness?

MRS. H.: I feel splendid.

DR. CRILE: I have gone through this with her several times in regard to her feelings before and after. As far as I can make out, neither Mrs. H. nor any patient who has diffuse goiter with hyperthyroidism completely controlled with propyl thiouracil has any residual symptoms referable to the disease.

Has there been any untoward effect of the medication? Have you felt sick in any way?

MRS. H.: None whatsoever.

DR. CRILE: Do you consider that taking the medicine is too much of a chore? Is it much trouble having your metabolism and your blood count checked regularly? Does it interfere with your daily life?

MRS. H.: Not at all.

DR. CRILE: She has been working right along throughout the treatment, and economically that is very important to some people. What would your reaction be at the present time to having a thyroidectomy?

MRS. H.: Well, I would rather take these little white pills the rest of my life.

DR. CRILE: That is the answer right there. The patient in the long run makes this decision. If you are honest with patients and tell them they can take this medication, which is, as far as we know, quite safe at least as compared with thyroidectomy, the rest of their lives if necessary, I am sure many of them will react exactly as Mrs. H. has.

If the hyperthyroidism recurred after the propyl thiouracil was discontinued a year or six months from now, you would not feel discouraged? Would you just as soon continue to take the medicine indefinitely?

MRS. H.: Absolutely.

DR. CRILE: Thank you. That is what I consider an ideal case not only in the type of hyperthyroidism but in the fact that we are dealing with an intelligent, cooperative patient who is, of course, in close contact with the medical profession. I believe that almost any of us would admit that when we have a medical means of controlling hyperthyroidism it is preferable in such a case.

THE SECOND patient I would like to present is Mrs. B., who had almost an identical history, a typical exophthalmic goiter coming on rather quickly. She had had iodine before we saw her. She is the only case in over a hundred patients whom we have treated with this drug who has shown any signs of toxicity and who has required a thyroidectomy. Mrs. B.'s basal metabolic rate was +45 per cent when she was first seen. Her basal metabolic rate fell to +19 on iodine. She was placed on propyl thiouracil and remained on the drug for about three months, but during that time she had frequent sore throats, which, by the way, were not associated with any leukopenia; she just seemed to develop one upper respiratory infection after another, and she was always worried about that because she had been warned about sore throats. Finally, after three months her leukocyte count did fall to around 4,200, and that was associated with only 25 per cent granulocytes. Her nervousness over the possibility of agranulocytosis, the fact that she had been so

slow in responding to the drug, and the undesirability of continuing to treat her over a long period of time with a drug to which she was showing toxic reactions, led us to go ahead and perform a subtotal thyroidectomy.

Mrs. B., I should like to have your reaction to how you felt while you were taking propyl thiouracil. Did you think there was any improvement in your general condition during the time you were taking it?

MRS. B.: None whatsoever.

DR. CRILE: I should also say that two of those months she was on the small dose originally recommended, which has subsequently proved to be insufficient—75 mg. a day. In the majority of cases, this dose is insufficient to produce a prompt subsidence of the symptoms, but even when Mrs. B. was on large doses she noticed no improvement.

How do you feel now?

MRS. B.: Wonderful.

DR. CRILE: This case is an argument for thyroidectomy, but the patient did not have a fair trial of propyl thiouracil because she did not take the drug long enough to make her metabolism fall to normal. Sooner or later, if we had been able to continue the drug without too much mental disturbance to both her and ourselves, she would have responded just as well to the use of the drug as she now has after subtotal thyroidectomy.

Thank you.

The next patient I would like to show had a nodular goiter with severe hyperthyroidism and complicating diseases. The problem in his case was the difficulty in obtaining his cooperation due to the fact that he understood English poorly and lived some distance away and it was inconvenient for him to come back and forth. He had a very severe hyperthyroidism, was very seriously ill and I feel certain could not have survived subtotal thyroidectomy with ordinary preparation with iodine. He was therefore prepared with propyl thiouracil and then subjected to thyroidectomy. He had a nodular goiter of the type which we still believe should be treated surgically.

He is 66 years old; he had lost 75 pounds of weight in two years, and in addition had epigastric pain and had been jaundiced for a month.

PHYSICAL examination showed auricular fibrillation, exophthalmos, a nodular goiter, weight loss, jaundice and the liver down two finger-breadths below the costal margin. The basal metabolic rate was +54. The electrocardiogram showed coronary disease.

The diagnoses in his case were nodular goiter with hyperthyroidism, auricular fibrillation, jaundice due either to cirrhosis of the liver or to hepatic damage from hyperthyroidism of long standing.

He was given 100 mg. of propyl thiouracil daily. At the end of two months his basal metabolic rate fell from +54 to +27, in three months to —4 per cent. He gained 10 pounds, the jaundice disappeared, the liver went back to normal size, and he was then subjected to a subtotal thyroidectomy.

His postoperative course on paper was smooth. The maximum temperature was 99.6 and the maximum pulse 100. In spite of that, in spite of the minimal postoperative reaction, with hyperthyroidism completely controlled, he was still so close to the borderline of overwhelming toxemia from long-standing hyperthyroidism and the liver damage that he was confused and delirious at night for a week following operation and gave us considerable care and anxiety.

He has now gained about 30 pounds and feels entirely well.

He says that he began to feel better about two months after he began to take the medicine. He felt definitely improved before the operation, but his metabolism had only been within normal limits for about three or four weeks before he was operated and he had not had time to obtain the full feeling of well being which one does obtain if the drug is continued for a long time, as was true in Mrs. H.'s case. He now feels entirely well.

You see how difficult it would be to handle

such a case indefinitely on propyl thiouracil when the language difficulty presents the problem of interpreting what is going on.

The final case is Mrs. T., who is 67 years of age and has a nodular goiter with severe hyperthyroidism and pernicious anemia and other complicating diseases. Because of her age and these complications, we have elected to treat her definitively with propyl thiouracil in spite of the fact that her goiter is a large, nodular, recurrent, intrathoracic goiter. She has no pressure symptoms and her age along with the other diseases make it seem advisable not to subject her to operation.

She had a thyroidectomy eleven years ago and a partial hemiplegia eight years ago. In the past six months she lost 37 pounds of weight and has had dyspnea, palpitation, nervousness and upper abdominal pain. She had a blood pressure of 240/110 and cardiac decompensation on entry. Her basal metabolic rate was +48 per cent and the blood, gastric analysis, and so forth, were consistent with pernicious anemia. Her electrocardiogram showed coronary disease.

Final diagnoses: recurrent intrathoracic goiter with hyperthyroidism, essential hypertension, hypertensive and hyperthyroid heart disease with decompensation, and pernicious anemia.

She was given 200 mg. of propyl thiouracil daily, liver extract and digitalis, and after four months of treatment her blood count is now normal, her heart is compensated, her pulse rate has fallen from 132 to 72, and she feels quite well. She has gained only eight pounds, but her metabolism has not fallen entirely to normal yet. This feeling of well being and the clinical improvement usually precede by a little the fall of the basal metabolic rate.

The question is, of course, should we advise operation. It is my feeling that if a patient such as this who has had a hemiplegia and severe hypertension and is 67 years of age has a goiter technically difficult to remove, she can better be carried along as she is on this relatively nontoxic drug.

How do you feel at the present time?

PATIENT: Fine.

DR. CRILE: You are able to do your work about the house and all of that without difficulty?

PATIENT: Yes.

DR. CRILE: Before that, she was incapacitated. You are willing to continue to take the medicine and you prefer that to operation?

PATIENT: Yes.

DR. CRILE: It doesn't require much care. She merely takes these pills, comes in every couple of months for a BMR checkup, and finds it no trouble.

In summary, I think we can safely say that since the risk of continuing to give propyl thiouracil for from six months to a year is so slight, it appears that in diffuse goiter with hyperthyroidism, medical treatment should first be given a fair trial and thyroidectomy advised only if the patient is intolerant of the drug, fails to co-operate, or for some reason prefers thyroidectomy. Such cases will, I believe, be few. In the past eight months I have had to operate on only one patient with Graves' disease.

One criticism of medical treatment of hyperthyroidism has been that it is possible that a carcinoma of the thyroid may be overlooked, but carcinoma of the thyroid does not occur in Graves' disease or in diffuse goiter with hyperthyroidism; it is in the nodular goiters that it occurs. At least if it does occur, it is so rare in diffuse goiter that I have not seen it. Even in nodular goiters the association of carcinoma and hyperthyroidism in the same gland is rare because it usually means that you have to have two separate adenomas in that gland, one which has developed a carcinoma and one which has developed a hyperfunctioning physiologic activity. It is extremely rare to have a carcinoma which itself hyperfunctions.

WHILE on the subject of carcinoma, I should like to present two patients who have had one of the more favorable types of thyroid carcinoma. These patients have papillary tumors of the thyroid with metastases to the lateral cervical region. It is a controversial point whether some of these papillary carcinomas of the thy-

roid with lateral cervical nodules represent multiple aberrant thyroid tumors of congenital origin, multiple primary tumors, or whether the lateral cervical nodules are actually metastases. In one of these patients, histologically the tumor was benign, although there were 20 to 30 lateral cervical nodules present. In the other patient, the tumor was histologically malignant, and in his case there was bilateral involvement with 20 or more nodules present on each side and in the superior mediastinum.

These patients were young when they came to us, 19 and 27 years of age, respectively. It is now five and nine years, respectively, since radical removal of the affected lobes of the thyroid and a dissection of the lateral cervical regions, and both continue well and their chest plates at the present time are normal.

EVEN in the presence of extensive lateral cervical tumors, prognosis may still be quite favorable in this type of thyroid carcinoma. I call it to your attention because if you think of this you will find a fair number of patients with this disease. They are not uncommon; we have seen 30 or 40 such patients in the last 10 to 15 years. You will find that they have a hard tumor in the thyroid gland, and in addition, have multiple nodules in the lateral cervical region. You may feel nodules under the sternomastoid in the neck—they may be high, they may be low. The commonest place is right under the sternomastoid. One of the things they are most frequently mistaken for is tuberculous glands of the neck. Always examine the thyroid carefully, have the patient swallow, and if you feel a little firm nodule in the thyroid, the chances are that you are dealing with one of these papillary carcinomas of the thyroid with lateral cervical metastases or multiple primary lateral aberrant tumors, whichever you call them.

The reason this group is of particular significance is that it represents the most favorable type of thyroid carcinoma from the standpoint of cure. It makes little difference if you can recognize a carcinoma which you cannot cure, the ultimate outcome is the same; but here you are dealing with a type of carcinoma which is curable if an adequate operation is performed.

Interestingly enough, it does not require a block dissection of the neck. We have now operated on some 25 patients whom we have had opportunity to follow for over five years and none of these have had block dissections of the neck with radical removal of the sternomastoid, jugular vein, and so forth. They have merely had a careful dissection, with removal of the glands, and in no case has there been uncontrollable recurrence of lateral cervical nodules. In only one case has there been distant metastasis through the blood stream.

This is the woman I told you about who had over 20 lateral cervical nodules scattered all the way from the superior mediastinum, with some below the clavicle, to just under the mastoid process with involvement of the right lobe of the thyroid as well.

The incision we used was a lateral cervical incision, which as a rule in mature adults heals very well, and the cosmetic appearance is good. In children it may cause a keloid. She does not have the deformity associated with ordinary block dissection of the neck. That is an important thing, because most of these tumors occur in women and most of them occur in young women, and you do not like, if you can possibly avoid it, to produce a deformity of the neck when equally good results can be obtained by a more conservative procedure.

She has been well ever since, with the exception of a nodule which occurred right in the midline, completely out of the field of operation, but present from the time of operation. This was an overlooked nodule which was removed sometime later, and that is the only residual that she has had. She is now well and the x-ray of her chest is negative.

Mr. G. had the same thing, except in his case it was bilateral, with both sides of the neck involved, and he had a bilateral neck dissection. He had at least 25 nodules on each side scattered throughout the entire cervical region. The entire lobe on the left was removed and on the right all of the thyroid was taken except for a

tiny shell containing a parathyroid. He also had mediastinal nodules. These things tend to go into the mediastinum and posterior to the carotid sheath, all the way into the posterior cervical region, up to the level of the mastoid process sometimes. It is the most extensive one we have seen, and yet Mr. G. has now been entirely well for five years and his x-rays show no evidence of metastasis.

IN SUMMARY I think we can say we must give serious consideration to medical treatment for diffuse goiter with hyperthyroidism.

If we are to reduce the mortality rate from carcinoma of the thyroid, it will not be by observing adenomas until we can make the diagnosis of carcinoma, because when you can make that diagnosis clinically it is too late in the majority of cases to establish a definitive cure. It is only by prophylactically removing any suspicious adenoma of the thyroid that one can hope in the long run to reduce the mortality rate from carcinoma.

The Bettmann Archive

Historical Epochs in Medicine: Galen, Prince of Physicians, (ca. 130-200 A. D.) is shown in this medieval miniature lecturing on gynecology.

DIAGNOSTIC CLINIC

Treatment of Syphilis with Penicillin

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THE USE of penicillin in the treatment of syphilis has been one of the greatest advances made in handling syphilis since man has been fighting this plague. We can all remember when we were forced to depend only on arsenical therapy and bismuth therapy. Any of us who have used this form of therapy can remember the many anxious moments we had in connection with arsenical reactions and arsenical deaths.

Later, Wagner-von Jauregg in Vienna suggested the use of fever treatment in central nervous system syphilis. Then Kyrle, also of Vienna, showed that the use of fever alone was not applicable to early syphilis.

It was next suggested that the arsenical injections be given more frequently; instead of giving only two or three, they began giving them once a week, then even twice a week, and later started the use of the intravenous drip. There is no question that a very appreciable proportion of the patients were cured. On the other hand, the reactions that ensued from this form of therapy were terrific. It appeared that further search was necessary.

A method was tried using an injection of an arsenical once a day for ten days, with bismuth about four times during that period of therapy, and with fever treatment on the second, fourth, sixth, and eighth days. This was the Thomas method of treatment from which we had good results, but also some severe reactions. This led up to the Army treatment suggested in the early part of the war: 40 injections of an arsenical and 16 injections of a bismuth compound in a twenty-six-week period.

Penicillin, the new remedy, then became known. When penicillin was found to be effective in the treatment of many infections, notably pneumonia, it was only natural to see what the new drug would do in the treatment of syphilis. Several workers tried its effects in experimental syphilis in rabbits. For some reason—we do not know just why—their experiments were not successful. Then John Mahoney and collaborators at the United States Public Health Service at Staten Island did some work with experimental syphilis in rabbits; later they reported on four patients with acute syphilis to whom they had given 2,400,000 units, giving it every three hours over a period of fifteen days. They still have two of these patients under observation and they are well.

It was around this time that the war started. Since syphilis is one of the scourges of war, the Army, the Navy, the Public Health Service, and the National Research Council, through the Office of Scientific Research and Development, launched one of the most gigantic cooperative medical investigations that has thus far been conducted on a public health problem. More has been done under this cooperative program in three years than was done in the preceding thirty years.

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Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

Much of the credit for this is due Professor A. N. Richards of the University of Pennsylvania, chairman of the Office of Scientific Research and Development committee; to the Committee on Chemotherapy of the National Research Council headed by Chester Keefer of Boston, and to the Penicillin Panel that was established to supervise and carry on the work. The Penicillin Panel, under Earl Moore of Baltimore, consists of syphilis clinics in various parts of the country, many of them operating in connection with universities like those at the University Hospital and at the Cleveland City Hospital, which are associated with Western Reserve Medical School.

We also must give credit to Surgeon General Thomas Parran of the Public Health Service, who has taken over this project since the Office of Scientific Research and Development has been dissolved.

What are the results of this work to date? I should like first to say just a word about the routes by which penicillin is used. At present, penicillin should not be given by mouth or by the rectal route. The dosage is too inexact.

Intrathecal use of penicillin is not without danger and should not be employed.

The intravenous method of treatment may be used, but is not applicable either for the physician or for the patients.

The intramuscular route is the preferable route thus far, the injections being given often enough to get and keep a high level of penicillin in the blood stream. Trouble results from varying levels of penicillin in the blood stream; for best results, a high level must be kept more or less continuously in the blood stream.

Another method of therapy has been suggested by Romansky of the Public Health Service—the use of calcium penicillin in peanut oil and beeswax. I mention this but I do not recommend it for the regulation treatment of acute syphilis. As a general rule, the preferable method is the use of the intramuscular injection every two to three hours, day and night, for seven and a half to fifteen days, depending on the duration of the infection.

I think we are all acquainted with the results that are achieved with this form of therapy.

WE PRESENT here a patient who is in the early stage of syphilis. He has contracted a primary lesion and has developed an extensive generalized annular papular eruption over his body and has been under therapy with penicillin for seven and a half days. His eruption has practically cleared up. Ordinarily, in an individual with an early infection, we find that the organisms disappear from the primary lesion in a matter of hours, seven to eight or ten or twelve hours at the most. The generalized eruption, depending on its severity, will clear up in a week to two or three weeks.

Probably the most important factor in controlling these cases is the titrated serologic examinations of the blood. It is not enough simply to say that the patient has a 4+ reaction or a 3+ reaction. It is necessary to have the patient's blood tested and titrated every month. It is not necessarily the number of units that has the most significance, because 8 Kahn units and 84 Kahn units will still be strongly positive reactions. It is the trend of the titer that counts, and by taking a titrated specimen once a month and examining it, you will be able to get some idea of how the patient is responding to treatment.

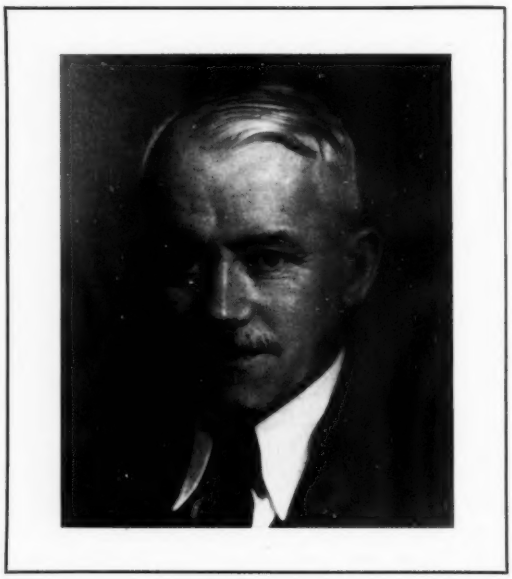
This patient had 64 Kahn units in his blood stream when he came to the clinic. He will be observed every month. If his titration goes up a few units in the beginning after the treatment, as is so often the case, we will not be alarmed; maybe the next month it will begin to drop; perhaps the next month it may even go up a little bit and then begin to drop. I repeat that it is the titrated curve that counts, and what we desire is a curve trend that will gradually drop to the base line, zero, and remain there. The patient is not considered cured until this has gone on for one year with completely negative serologic reactions. Any physician who treats syphilis with penicillin is not doing his duty by his patient unless he uses titrated tests.

In early syphilis, the best results will be

achieved in the so-called seronegative primary phase where diagnosis is made with the darkfield and treatment is started before the serologic test has become positive. In such patients it would be well to give, over a seven and a half-day period, 3,600,000 units of penicillin, giving the injections every three hours day and night. If the process has lasted for a somewhat longer period of time, it probably would be well to give 5,400,000 units over about the same period of time.

An editorial about penicillin entitled "Facts and Rumors," in the *Journal of the American Medical Association* some time ago, pointed out that we first used a crude penicillin; that later it had been perfected; and that whereas in the beginning there were not many units of penicillin per milligram, this had been increased; also that most penicillin consisted of F, G, X, and K. At present most of the penicillin on the market is G; there may be a certain amount of the other components. Unfortunately, in 1945 there was quite a lot of penicillin on the market that had K in it. K is very rapidly destroyed and is not the desired therapeutic type of penicillin. As a result, there were many relapses and the results of the treatment were not very good. At present, all penicillin is being very carefully observed by the United States Food and Drug Administration and by the Council on Pharmacy and Chemistry of the American Medical Association, so one need not hesitate to employ it.

How would you use penicillin in late and latent syphilis? In such situations, we have a process that has lasted for quite a period of time. In latent syphilis there will be no evidence other than a positive serologic test and a history of syphilis. In late syphilis, there are cutaneous tertiary lesions, gummata in the liver, and so on. For these patients, it is probably best to give a preliminary series of 6 injections of intramuscular bismuth, bismuth subsalicylate 1 cc., about once in five days, and then to put the patient on penicillin, about 3,600,000 units over a period of seven and a half to fifteen days. The preliminary use of bismuth is to obviate any therapeutic paradox; that is, too rapid healing of a lesion and perhaps the formation of scars and contractures that might be deleterious to the patient.



Harold N. Cole

What are the results in central nervous system syphilis? We are all interested in that, because undoubtedly many of us have these types of cases.

RESULTS vary in central nervous system syphilis, depending upon the duration of the process and on whether the type of involvement is of the meningeal or of the parenchymatous type, such as we find in tabes and paresis.

When we first began the use of penicillin, we had a female patient 38 years old at the City Hospital who was given 300,000 units. That dosage today would, of course, bring a smile and that is about all; it was an absurdly low dose to employ. About a year later this patient, who had been under observation, came back to the clinic complaining of frontal headache, of confusion, of stiff neck. She had a paralysis of the left facial, and a paralysis of the left hypoglossal; a titrated blood specimen

showed 64 Kahn units. A lumbar puncture was done and it was found that she had 3,200 cells, mononuclears. In other words, she had a syphilitic meningitis. Her total protein was 65 mg. per cent, the normal being around 25 to, at most, 35 mg. per cent. She had a paretic curve, a serology in the spinal fluid that was strongly positive even with 0.1 cc. of the fluid. We titrate the spinal fluid also.

This patient was put on 4,000,000 units of penicillin. I will not mention the intermediate steps, but at the end of nine months her cell count on the spinal fluid was 10, which is the upper limits of normal; her total proteins were 20 mg. per cent; her gold colloid curve was completely flat, changing from a paretic type; she still had a 3+ reaction with 1 cc. only of the spinal fluid. In her blood serologic tests, the titer gradually has dropped and has become completely negative.

We felt this patient was cured. She has been kept under observation since then. We have continued to do titrated serologic blood tests on her, also lumbar punctures, and thus far we have found no reason to give her further therapy.

That indicates what may occur if you get a case early and put it under proper therapy. These patients must be carefully followed, however. The older the involvement of the central nervous system, the poorer the prognosis. This is particularly true with parenchymatous involvement such as we have in tabes and in paresis.

This patient is an indication of the necessity of early lumbar punctures on all cases of syphilis. They should be followed along, and while under observation and treatment should have a lumbar puncture certainly every six months, if negative, and every three months, if positive. Only in that way can we be sure to detect an early involvement of the central nervous system and start treatment.

One of the places in which we get a brilliant result in syphilis is in pregnancy. In our clinic we have treated 1,500 or 1,600 cases of various forms of syphilis with penicillin, and we have had about 65 cases of early syphilis in pregnancy. Some of these mothers have even had a second child and in a couple of instances have had twins.

We have had but two cases of congenital syphilis in the entire group where penicillin has been employed. That is a real achievement in medicine. In these two cases, as you will see, it was quite excusable that this should occur. In one instance the mother had one of the low dosages, 300,000 units, and she, of course, had a relapse. The child was born with a mucocutaneous syphiloderm and a meningitis. The child was put on treatment and is well today. In the other case, the mother came into the City Hospital with a generalized syphiloderm. We managed to give her two days of penicillin therapy before the child was born. Naturally, that was not sufficient and the child had a syphilitic meningitis, a generalized eruption, and the typical changes that are found in the bones in congenital syphilis.

We have had eleven different mothers who received treatment in the last three to four weeks before their babies were born, another one week before, another five days before, and three just before and during the pregnancy so that we were not able to give all the penicillin before the child was born; yet all the children are well today.

It is necessary to do a titrated Wassermann on these children. We do it every month. You get the cord blood Wassermann test, which, of course, is the mirror of the mother's situation. If the titer drops, it indicates that the child has been cured. After observing the child for a year we feel that he is well. If, on the other hand, the titer goes up, we look for a relapse and, after consideration of the radiographic studies, may decide to put the child on treatment.

One patient we had under treatment is 19 years old; she had a generalized eruption of syphilis for one month before she came into the hospital; she is in the fifth month of pregnancy and has been placed on penicillin. It is probably just as well to start these pregnant mothers with small doses at first. She was put

on 20,000 units every three hours for eight doses and then 80,000 units every three hours for 118 doses. She has cleared up and we expect to get a perfectly normal child in this case and hope the mother will be cured.

In congenital syphilis, penicillin is again of great value. We may have to use supportive measures for a few days, such as bismuth, and then put such patients on penicillin therapy, giving 100,000 to 400,000 units per 2.2 pounds, that is per kilo, over seven and a half days. These patients, of course, must also have a titered serology.

We now come to another problem in connection with syphilis, the subject of relapse, a very important aspect of the disease. There are different types of relapse, as we may imagine.

For instance, one patient, a woman 36 years old, received 1,600,000 units of penicillin in October, 1945. The titer was 32 Kahn units. With this therapy the titer gradually dropped to 4 Kahn units. It never went down to the base line. We followed it along, and all at once it rose to 32 units. The patient was hospitalized. There were a few mucus patches, indicating that the patient was just relapsing. She has been put on therapy again and we are confident that she will respond to a higher dosage—9,000,000 units.

We are seeing quite a few examples of relapse in individuals who have had Neisserian infections and have had a single injection of penicillin calcium in peanut oil and beeswax. The doctor does not detect the primary invasion of syphilis. Perhaps nothing shows at the time and unless these patients are followed monthly with a titrated serology for four or five months, the physician may overlook a syphilitic infection that took place at the same time as the Neisserian infection. It is very important in all cases with Neisserian infection treated with a single injection of penicillin calcium in peanut oil and beeswax that a titrated serologic test of the blood be taken monthly.

I THINK there is no question but that we have a very valuable remedy in penicillin. One reason is that there are no severe reactions with it. Rarely is there an angioneurotic edema, for example, or a dermatitis exfoliativa. We do not have to worry, as was formerly the case with arsenical therapy. That in itself will be a great help. Moreover, we have a remedy that renders the patient innocuous as far as public health is concerned in at least two weeks. Also, we have a remedy we have never had before for treating syphilis in pregnancy and for treating congenital syphilis. And, too, this probably is going to offer us far more than we have had before in the treatment of central nervous system syphilis. While we are going to find that it will be elaborated a great deal over what we now have, and better methods of administering it may be brought out, even today considering the absence of severe reactions we have a remedy for treating syphilis that is better than anything used in the past.

EDITORIALS

INTER PRIMA

THE BIRTH and development into full maturity of the present Interstate Postgraduate Assembly is a story in itself. In its conception a need was visualized and in its growth a true service has been performed. As an organization, it has weathered war and peace, criticism and praise, depression and prosperity and is bigger and better for all of these experiences.

Motivated primarily by the ideal of service to the medical profession and through it to humanity, it is natural that all means of furthering this end be considered. Among the ideas mulled over for years has been that of sponsoring a medical journal. For one reason or another not until now has the idea been translated into reality.

There are those who are of the opinion that there are already too many medical journals and magazines. There is much to be said in support of this opinion. It is equally true that there are not too many in the top bracket.

It is and will be the objective of those concerned with *Postgraduate Medicine* to produce an authoritative, diversified, stimulating medical journal of which American medicine will be proud.

C. W. M.

POSTGRADUATE MEDICINE

Official Journal of the Interstate Postgraduate Medical Association

Editor in Chief	CHARLES W. MAYO
Managing Editor	ARTHUR G. SULLIVAN
Assistant Editor	SYLVIA S. COVET

JANUARY, 1947

EPITOME OF MEDICAL KNOWLEDGE

THIS journal is published with the object of giving progressive medical men an epitome of medical knowledge and teaching on matters of practical importance in their daily lives. We will present authoritative original articles of high scientific value and great clinical interest. The emphasis will be on treatment. The approach will be informal. Medicine will be written about as it is found in actual practice rather than discussed as if it were on "dress parade." The basic editorial fare will be the seventy or more papers read at the annual meeting of the Interstate Postgraduate Medical Association assembly. The articles will be presented from the "doctor-to-doctor" point of view, in the

spirit of colleagues. The "teacher-pupil" manner will be taboo.

These pages should stimulate those whose interest lies in the furtherance of their knowledge for the benefit of their patients, and those whose ego feels the urge for profound thought. The discussions of selected subjects will be of utmost value in the collation of all recent knowledge on that subject and should prove of great value to physicians studying for higher qualifications.

Postgraduate Medicine will reflect the personality of its sponsor, the Interstate Postgraduate Medical Association. The general tone will always be clinical, the presentation practical. It was the very utility of the Postgraduate assemblies that caused the association, organized at a district assemblage of physicians in 1916, to expand successively to state, national and international levels. This same practicality will be preserved in the magazine, thereby increasing the scope of the association's postgraduate medical educational activities.

Beginning in 1925, the clinics and addresses presented at the Assembly that year were published in a single volume—the advent of the first of twenty issues of the annual Proceedings. In 1945, the United States government's ban on large assemblages prevented the holding of the 30th annual Assembly and caused a lapse in the publication of the Proceedings. Much thought was directed to the preservation and dissemination of the top quality contemporary medical instruction presented at each assembly. Despite rapidly rising publication costs and the diminution of subscriptions occasioned by the tremendous dislocations of doctors due to the war, the association was reluctant to increase the selling price per volume of the Proceedings. The conclusion was inescapable that the inauguration of a broader base by means of a monthly magazine would afford the desired ends.

Establishment of a periodical not only would give a larger outlet to the Proceedings but also would permit the utilization of much splendid additional material. There was, though, a consideration not to be tossed lightly aside. Many physicians, clinics, medical school and medical society libraries had purchased annually and preserved all the twenty volumes produced since 1925. They might regret a change in publication policy. It has been heartening, indeed, to find that assurance of the continuation of the Proceedings in this new form has proved entirely acceptable to this group.

Freed from the strict spatial and cost limitations imposed on the annual Proceedings, Postgraduate Medicine will be able to publish much material which could not be presented at the assembly because of full programs. Since a good illustration is often worth a thousand words, the editorial policy of the monthly journal will be to use illustrations more lavishly than ever has been attempted by any other regular medical publication.

Supplemental features are being planned for the journal, several of which are included in this first issue. These departments are addressed to the doctor as a man, as well as a scientist. In this very space each month will be found editorials written by members of the editorial board or by contributors on topics related to the professional and scientific interests of medicine. Excerpts from outstanding editorials of other medical journals will appear each month in a department entitled "What Other Editors Think."

A Consultation Service is being inaugurated in which men may seek answers to the various problems that come up in their practice. "This Month in Medicine" will comprise a readable

summary of medical progress. Another department will be concerned with the activities of the Interstate Postgraduate Medical Association affairs. A Correspondence Column will give the reader the floor. Contributions, criticisms, suggestions and even diatribes will be accepted from responsible sources. The free and open nature of this department will serve as a safety valve on the editorial policy of the periodical and will be an assurance that the publication will be tolerant, open-minded, scientific and fair in its approach to all opinions on medical topics. The informality of the periodical itself will permit the printing of more vigorous letters than are usually to be found in a medical publication.

Fine writers and great reporters will be solicited for contributions to our "Men of Medicine" department. Literary quality as well as textual interest also will be emphasized in informal columns, such as "The Doctor in Literature." A book review department is being readied for introduction in an early issue. Other departments being considered include descriptions of new drugs and instruments and an authoritative section on clinical photography.

Thus our aims are high, our plans great. To achieve them the editors invite your urgent and express cooperation. Send in your papers and reports on your work, on your interesting cases. Send in your criticisms, adverse or laudatory, of the papers published in these pages. We shall not be afraid to print or publish all that is worthy of Medicine Today. Our editorial motto may well be borrowed from Matthew Arnold: "I am bound by my own definition of criticism; a disinterested endeavor to learn and propagate the best that is known and thought in the world."

And so at long last, in its 32nd year of teaching, the Interstate Postgraduate Medical Association presents its official monthly publication, *Postgraduate Medicine.* J. G. C.

MAJOR, RENEW YOUR MALPRACTICE INSURANCE

MANY returned medical war veterans have failed to renew their protective policies. Malpractice suits are gradually again increasing in number. The curve in these law suits closely approximates the curve in the national "take home" income—with most claims being filed during the depressions.

A recent judgment assessed against an uninsured veteran who resumed his practice last April will keep him impoverished for a long time. He intended to renew his policy, lapsed during his service with the armed forces, but forgot the matter until the summons and complaint were served. A. G. S.

IS THERE AN "HYSTERECTOMY RACKET"?

A RECENT visit with a seasoned pathologist from a three hundred bed hospital disclosed his conviction that far too many uteri were removed than could be justified on the basis of the tissue examinations, or even by his personal review of the hospital histories of those patients. He pointed to the recent era when appendectomies, Caesarian sections, kinked ureter cases, and even blood transfusions reached such astronomical statistical percentages in many hospitals throughout the land—and not those exclusively treating charity cases. A nasty implication.

Legislation often has been proposed placing the legal burden of justification on the surgeon who removes an appendix which from the pathologist's examination was normal. Defeat of these proposed laws was largely due to the determination of the legislators that their own

normal appendices should be removed by their trusted surgical attendant if in his judgment, during an abdominal operation for other pathology, he decided that it was a prudent act of generosity to extirpate, in addition, this treacherous appendage.

Nevertheless, the hospital pathologists see a startling discrepancy in the number of hysterectomies done by surgeons with comparatively similar practices.

This coupled with the absence of supportive gross or microscopical pathological data assuredly poses the question—Is there an "hysterectomy racket"? A. G. S.

SPECIAL TRIBUTE TO OUR EXHIBITORS

WE WOULD be remiss in this first issue, which now permits release from our former inarticulate status, if we failed to pay a richly-deserved tribute to the medical and the surgical manufacturers for the generous and loyal support which they have increasingly extended to the Interstate Postgraduate Medical Association at each annual meeting. Perhaps the most important factor in our success and progress has been the constancy of this generous support.

Aside from the monetary considerations, the exhibitors have brought to each Assembly a massive educational opportunity which observant and appreciative physicians have often remarked as being as interesting and valuable as the lecture courses themselves.

Far too few doctors appreciate the wealth of dependable information which may be obtained from our Exhibitors. Few realize that many of these men who patiently and repeatedly demonstrate the drugs, instruments, and appliances at our Assemblies, often are distinguished scientists.

How impotent we would be in our daily ministry to the sick if we had to compound our own unreliable remedies, or painfully fabricate our own tools, as once prevailed.

From the standpoints of both volume and mass accomplishment, it is a long time since bacteriological, pharmaceutical, physiological, and pathological research in this country passed from the medical schools and clinical laboratories to the increasingly expensive and productive research laboratories of the American medical and surgical manufacturers. The large medical schools and the great clinics of this country annually encounter, with painful regret, the transfer from their staffs of some of their most brilliant research workers to these tremendous research enterprises. Fortunate for both doctors and patients that manufacturers seek and can afford the best!

Detailing of drugs, instruments, and appliances to the doctors at medical meetings is at best an exhausting endeavor. It is innervating when the doctor is truly interested in the product demonstrated, and the more so, when the doctor's interest is enhanced by a background of competent education in the special field under consideration. It is wearying and painful when the doctor is an obnoxious individual with a superiority complex and devoid of any special information or training in the field discussed.

For the generous contribution made by the one hundred seventy-eight exhibiting firms at our recent Cleveland Assembly, we express our deep gratitude—and our readers will more fully understand when we acknowledge that the registration fees paid by the physicians present were sufficient to meet but twenty-five per cent of the costs.

A. G. S.

This Month in Medicine

CANCER RESEARCH

CANCER has increased in importance, as the population has aged. Indeed, during the past few years, perhaps no pathological condition has attracted more attention than has carcinoma. Numerous causes have been postulated; as many cures have been recommended. While much of this endeavor has led to naught, some suggestions have been peculiarly interesting and stimulating. The recent work of Ayre and his associates in Montreal is illustrative. These workers have followed the lead of Papanicolaou, in investigating the possible diagnosis of cancer by the vaginal and cervical smear techniques. Ayre extended the field, however, in describing a precancerous condition which is readily recognizable in smears, although the patient's cervix may show no objective evidence of disease other than a tiny circular reddened area about the external os. The smear reveals anaplastic squamous cells; abnormally high cornification; a tendency to multinucleation of the cornified cells; and atypical cornified cells showing large pyknotic dense nuclei. This association of cytological findings has been found to be indicative of precancerous squamous hyperplasia at the squamocolumnar junction.

Some months ago, Ayre and Bauld reported the association of an abnormally high endogenous estrogen level, a low thiamine excretion, and the presence of uterine cancer; now they find the precancerous cytological condition, the atypical hyperplastic and anaplastic cells, in individuals manifesting these high estrogen and low thiamine levels. Almost 90 per cent of 50 cancer patients showed this linkage, whereas the majority of a similar group of 50 normal individuals of the same age did not. Ayre suggests that some metabolic growth factor is involved, which is influenced by nutritional levels and is associated with estrogenic factors.

The findings of Ayre and Bauld could be interpreted in the light of Biskind's demonstration, that members of the vitamin B complex are essential to the protection of the liver from toxic agents. With vitamin B deficiency, the liver cannot inactivate endogenous estrogen. Biskind's views fit nicely with the findings of Ayre and Bauld. Just why an excess of estrogen should cause uterine cancer is inexplicable, but over a decade ago Allen warned against the use of excessive estrogen therapy, on the grounds that it might stimulate neoplasms. In like vein, Henry, only last year, attributed two cases of precancerous or cancerous changes in the endometrium, to estrogen therapy.

Suggested Reading:

Ayre, J. E. (1946), Vaginal Cell Examination as a Routine in Diagnosis, South. Med. J., 39:847, November.

Ayre, J. E.; and Bauld, W. A. G. (1946), Thiamine Deficiency and High Estrogen Findings in Uterine Cancer and in Menorrhagia, Science, 103:441, April 12.

Several papers by Biskind and his associates have appeared in Endocrinology, 30:819, May, 1942; Surg., Gynec., & Obstet., 78:49, Jan., 1944; and Exp. Med. & Surg., 3:299, Nov., 1945.

Henry, J. S. (1945), The Avoidance of Untoward Effects of Oestrogenic Therapy in the Menopause, Canad. Med. Assn. J., 53:31, July.

CIRRHOSIS OF LIVER AND DIET

THE past month another paper appeared which touches upon a topic about which ideas are changing. For a long time cirrhosis of the liver has been associated with alcoholism. The association was fortuitous and based only on circumstantial evidence. And in spite of much data to the contrary, the habit of thought—alcoholism and cirrhosis—still persists. The more enlightened view, however, dictates that hepatic cirrhosis is primarily a nutritional disease and develops in an alcoholic who refuses an adequate diet. Hence the dietary treatment of cirrhosis, developed by Patek, Morrison, and others, has been endowed with a good measure of success. Meienberg and Snell studied 50 repatriated prisoners of war, who had for many months been given a deficient diet, but who had not had access to hepatotoxic agents, such as alcohol. Nor did they show evidence of systemic disease. A high incidence of hepatic damage was revealed among these men. In some only slight functional impair-

ment was noted, while in others the damage had proceeded to early cirrhosis. In the absence of other agents which could have been responsible, the authors reasonably conclude that dietary deficiencies produced the hepatic changes.

Suggested Reading:

Papers by Patek may be found in Proc. Soc. Exp. Biol. & Med., 37:329, 1937; J. Clin. Invest., 20:481, Sept., 1941; and Bull. N. Y. Acad. Med., 19:498, July, 1943.

Morrison, L. M. (1946), The Response of Cirrhosis of the Liver to an Intensive Combined Therapy, Ann. Int. Med., 24:465, March 1.

Meienberg, L. J., and Snell, A. M. (1946), Nutritional Deficiency as a Probable Cause of Hepatic Damage in Repatriated Prisoners of War, Gastroenterology, 7:430, October.

MAN AND MOSQUITOES

MELLANBY, in *Nature,* recently discussed a little-investigated field, the reactions of human beings to the bites of mosquitoes. He confirmed the views of others, that individuals differ widely in their reactions to insect bites, and that continued exposure may alter individual reactions. Mellanby divided reactions of human volunteers who had never been bitten by mosquitoes into four categories: (1) When a subject was bitten by *Aedes aegypti* for the first time, there was little cutaneous response other than a tiny red spot at the site of the bite, but 20-24 hours later a delayed reaction occurred, a red patch 3 cm. in diameter surrounding the bite, with a definite weal in the center, which persisted for several days. (2) After the individual had been bitten on several occasions for about a month, his cutaneous reactions were decidedly different. Immediately after a bite, a weal developed at the site of inoculation, an area of erythema surrounded the bite, and itching was intense. These symptoms disappeared within 2 hours, but 20-24 hours later the same delayed reaction occurred. (3) After many bites, over a longer period, reactions were again changed. The immediate reaction persisted, but the delayed reaction gradually became less severe and eventually disappeared. (4) Mellanby's subjects never showed reactions less severe than class 3, but in individuals who have been exposed to thousands of bites the immediate reaction is quite transitory and disappears almost immediately.

Human reactions show a high measure of species specificity; thus a man may give a stage 1 reaction to *Aedes* and a stage 2 reaction to *Anopheles*. The whole problem, then, appears to be related to the antigens with which the mosquitoes, while feeding, inoculate human beings. Similar phenomena have been observed on the West Coast, where the native population is fairly immune to the bite of fleas, but newcomers are plagued with them. Investigations have been in progress for some years leading to the development of artificial antigens which, upon inoculation, render one insensible to the outrages of insects. Certainly such a product would be a godsend to those of us who are regarded as delicacies by the insect world.

Suggested Reading:

Mellanby, K. (1946), Man's Reaction to Mosquito Bites, Nature, 158:554, October 19.

STREPTOMYCIN EFFECTIVE IN SYPHILIS TREATMENT

THERE will probably never be too many cures for syphilis, because in any group of syphilitic patients there are refractory cases. Of interest, therefore, is the recent report of Johnson and Adcock that streptomycin effected a cure of syphilis in rabbits. These workers administered streptomycin to syphilitic rabbits at the rate of 42.5-45.5 mg. per kg. body weight per day. After 72 hours' treatment, spirochetes disappeared from material examined by darkfield; when the rabbit's testicles were transferred to two other rabbits, syphilitic changes did not appear. Other evidences of the effectiveness of the drug were manifest; popliteal transfers did not cause syphilis; the quantitative Kahn became negative.

Herrell and Nichols, some months previously, reported early favorable response to streptomycin in the treatment of human syphilis, but later relapses. The present authors point out that on the basis of body weight, their rabbits received 3-5 times as much streptomycin as did the human patients. The present work on experimental animals corroborates the findings of Dunham and Rake, who reported similar results. In view of these findings, further investigation of the antisyphilitic activity of this interesting antibiotic are indicated.

Suggested Reading:

Johnson, S. A. M., and Adcock, J. D. (1946), Treatment of Experimental Syphilis in Rabbits with Streptomycin, Proc. Soc. Exp. Biol. & Med., 62:109, June.

Herrell, W. E., and Nichols, D. R. (1945), The Clinical Use of Streptomycin, Proc. St. Meet., Mayo Clinic, 20:449, November 28.

Dunham, W. [illegible]nd Rake, G. (1946), The Activity of Streptomycin in Experimental Syphilis, Science, 103:365, March 22.

WAR ADVANCES ANESTHESIA

ONE of the fields of medical endeavor most advanced by the war was that of anesthesiology. For one thing, the professional status of the hospital anesthetist was greatly improved. He was a key man in most military installations, and his special virtues were more appreciated than they had been in civilian institutions. Further, an intensive training program increased by 50 per cent the number of skilled anesthetists. Various anesthetic agents were reappraised after studying on a large scale. Since the inflammable gases, ethylene and cyclopropane, were prohibited in Army hospitals, the anesthetist had to revive the use of nitrous oxide. To many, the results from this gas were a pleasant surprise, because in some respects it was found superior to cyclopropane. Nitrous oxide is nonexplosive and produces no cardiac disturbances; induction and recovery are more rapid and pleasant. Pentothal sodium was found to have its greatest field of usefulness in operative procedures that do not consume more than 30 minutes, in which good relaxation is not essential, and when the patient is in good condition. Early in the war, as a result of misinformation as to the limitations of pentothal sodium, the mortality rate from its use was 1 in 450. But as the result of restrictions and better understanding of this agent, the mortality from pentothal dropped to 1 in 5,500 in spite of its increased use in combat areas. Procaine was confirmed as the safest all-round local anesthetic; and in doses up to 150 mg. was recommended as the spinal anesthetic agent of choice. Inhalation anesthesia with ether, or nitrous oxide-ether, was found to be the best anesthesia for patients in shock.

Suggested Reading:

McCarthy, K. C. (1946), War Advances Anesthesia, Ohio St. Med. J., 42:1150, November.

USE OF THIOURACIL IN HYPERTHYROIDISM

SINCE 1943, the medical treatment of hyperthyroidism has undergone a most radical change. The inhibition of thyroid endocrine function by thiouracil and thiourea presents a therapeutic mechanism which is novel to medicine. The indications and limitations of these drugs have been extensively explored, with the result that they may now be employed with assurance. Of late, a spate of papers have appeared which further define the conditions under which they, particularly thiouracil, the more active of the two drugs, may be used. Most authors believe that thiouracil should be used primarily as a preoperative treatment of hyperthyroidism. Means finds thiouracil, in combination with iodine, the most complete preparation that has ever been available for thyroidectomy. Egan believes that the prolonged use of thiouracil might be considered, if surgery is regarded as exceptionally hazardous. That is, he evaluates the hazards of medication against those of surgery. This view is shared by Haines and others. Fowler reports that serious toxic reactions occurred in not over 4 per cent of 1,573 hyperthyroid patients treated with thiouracil. To prevent granulocytopenia and other side effects of medication, Markson administered liver orally with the thiouracil. Although it did not prevent the thiouracil-induced granulocytopenia, it did apparently lessen the milder thiouracil side effects. Cavanaugh and De Courey believe that thiouracil should be used principally in those patients that have become "iodine-fast," or in those in which thyroidectomy is contraindicated.

Suggested Reading:

Means, Ann. Int. Med., 25:403, Sept., 1946.

Egan, J. Lancet, 66:326, October, 1946.

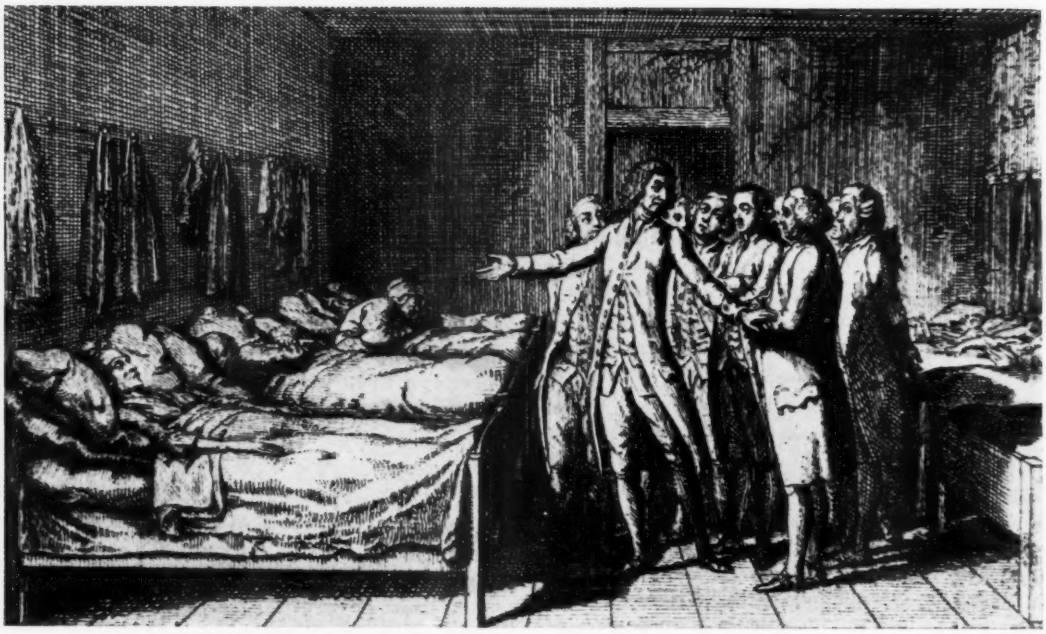
Haines et al., Med. Clin. N. Amer., 30:845, July, 1946.

Fowler, E. F. (1946), Treatment of Hyperthyroidism with Thiouracil, with Particular Reference to Toxic Reactions, Int. Abst. Surg., 83:313, October.

Markson, C. A. (1946), The Concurrent Use of Liver and Thiouracil, Canad. Med. Assn. J., 55:22, July.

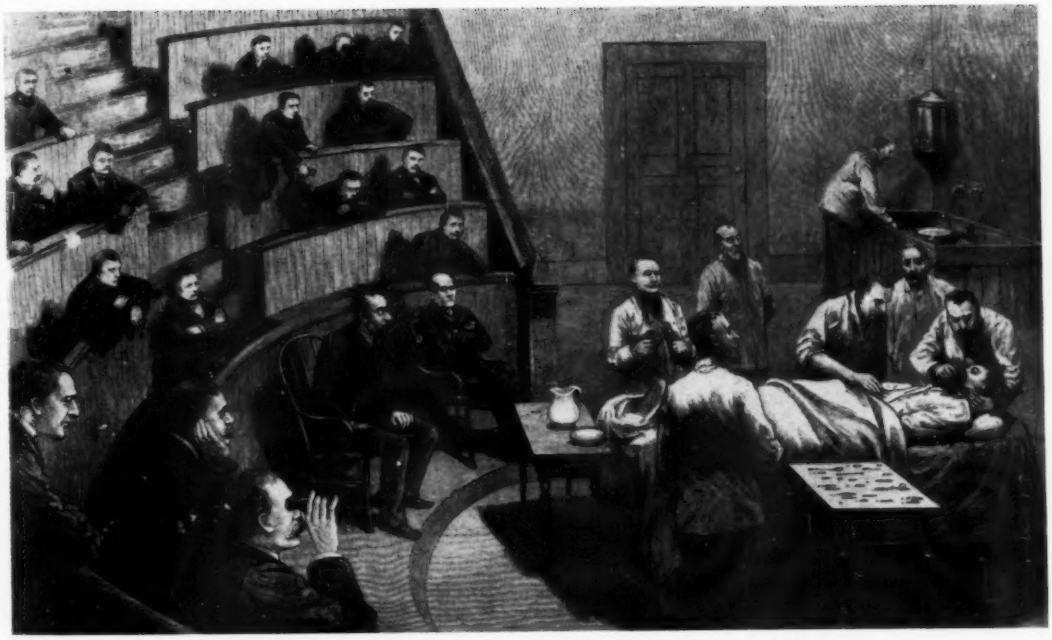
Cavanaugh, H. N., DeCourey, C. B. (1946), Pharmacology and Therapeutic Aspects of Goiter; Thiourea and Thiouracil, Ohio State Med. J., 42:1154, November.

R. W. CUMLEY, PH. D.



Doctors at the sickbed. Engraving by Chodowiecki 1781.

Postgraduate work under difficulties. Physicians in early American Colonies had a hard time studying the human body. Religious and other prejudices prevented them from obtaining study material. Drawing shows a group of medicos who had to resort to body snatching, surprised by the police.



Surgical amphitheatre in the Massachusetts General Hospital during the second half of the 19th century.

In the Hospital. Painting 1889 by L. Jiminez.

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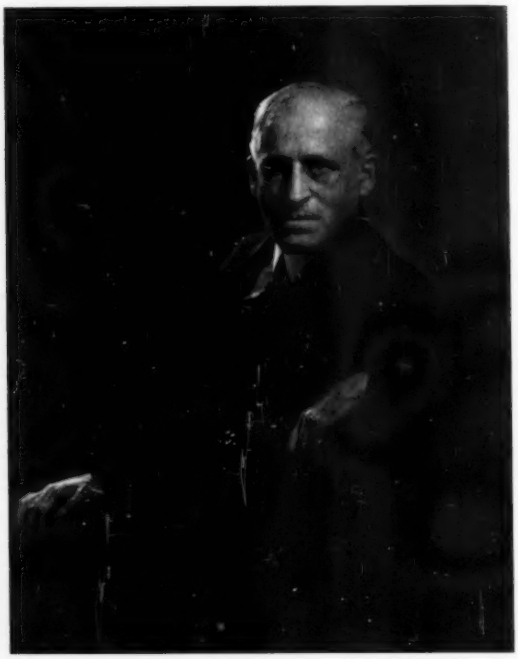
Men of Medicine

Great Diagnostician



Emanuel Libman

IT SEEMS quite in the natural order of things that he who was one of the most famous of diagnosticians should in the last of his cases "muff the diagnosis." And it seems quite proper too, as if to fulfill the demands of the dramatic dénouement, that the last of his cases should have involved none other than his own ailing and enfeebled person.

He diagnosed his case as an acute surgical belly, and so dominant was his authority that those who were called in to examine him would not gainsay him. Only the surgeon demurred, insisting that the clinical picture was not clear. Yet even he was prevailed upon to operate, though not until he had it set down in black and white that he did so under protest.

The belly was not acute. Such pathology as was to be seen was chargeable to the ravages of time.

The great diagnostician had muffed the diagnosis and he never recovered. On June 28, 1946, Emanuel Libman breathed his last breath on earth.

But the diagnosis was of little matter, for in any case death was not far removed. His thread of life had worn thin, and he himself knew it well. He spoke so long and so often of his oncoming exit that, impatient with the theme, I chided him in Milton's words:

"What need a man forestall his date of grief,
And run to meet what he would most avoid."

Yet when the end did herald its proximity, he misread the signs. "This is not death that spears my side—it is some local hurt. A small incision; a quick extirpation; and in a jiffy, I'll be myself again." God rest his soul!

Emanuel Libman *was* an extraordinary soul. He was not cast in the common mold, and there is no measuring of him by the standards of everyday men. By those standards he is at once both too little and too great, that is, incomprehensible. But incomprehensible, he was not. It merely takes an uncommon slant to see him in his true perspective.

He was a friend to youth and to man in far the best sense of the term. Many, were they willing and able, could attest to his generosity, freely shown in every way, in aid, encouragement, and good counsel, given without thought of return or counter gain. Many among the elders were by his distinctive efforts saved from the misery and death that menaced them when the fury of the Hitlerite hordes engulfed Europe. He had a profound regard for character and for sound achievement. He hated humbug and pretense. Such he could transfix with a piercing comment. Of one among his contemporaries he said, "He speaks a false face English." Of a young psychiatrist he observed, "He has a large vacuole in his soul." He was eminently correct in both instances. But most remarkable was that though you were aware of the faults of both men, yet his phrases literally opened your eyes to precisely what was the fault.

He was a good hater, but he hated few men. He praised and admired more amply. He was full of fondness and admiration for Osler, but had a still higher regard for William Welch. Will Mayo was one of his heroes; so was Ehrlich, and he was fond of telling and retelling the story of how Ehrlich on his visit to America sought him out in his laboratory, even though some of the elder statesmen attempted to steer the Geheimrat along other paths.

He knew the elect in all walks of life both here and abroad. Some were his patients—Einstein, Boris Sokoloff, Sarah Bernhardt; others were his admirers, or his colleagues. The west wall of his office was covered with the autographed portraits of "his friends"—the Immortals of Medicine were all there—Horder, Noguchi, Osler, Welch, Carrel, Lewis. He was both modest and proud of this galaxy and passing by, would touch your sleeve and recount in his quick staccato voice some nugget of an adventure. And as he spoke, his eyes would twinkle and a thin smile would play about his thin lips. You were then made particularly aware of his extraordinary agility, of the nimbleness, speed, and dexterity of all his being. He seemed geared in a higher ratio, and all men were lumbering and cumbrous in his presence.

Neither his thoughts nor his speech were paced to a normal gait, but seemed rather to dart hither and yon in unpredictable directions. The effect was somewhat bewildering and he studiously cultivated the effect. He played with relish the role of the *wunder rabbi*. In Lindy's restaurant he was greeted effusively by a man whose father he had treated. Libman pretended he did not recognize him. But on being told the man's name, he recited forthwith the full history of the case, with some details of local color besides. The effect was magical. He had a prodigious memory. But he loved the theatrical effect. There was a touch of the Oriental about him and he preferred the Arabesque to the Gothic. This was reflected as well in his neckties as in the play of his mind. He was never devious in the manner of the timid and the malevolent, but he moved in arcs and spirals by a native preference. Add the nimbleness of his wit to the unorthodoxy of his orbits and you will see why he puzzled and bewildered so many of his contemporaries.

He had keen esthetic sensibilities, and was particularly responsive to music and color. He was also a cultivated gourmet. To dine with him was to experience a double adventure. An excellent repast was always assured, and with it a display of rare artistry in the blending of foods and drinks. Yet with all this he catered to his guests' tastes and was both knowing and mindful of their preferences. He was ever a gracious host, and always without ostentation. Yet he exacted his tribute. He rather talked than listened; rather led than followed the conversation. But who that had the privilege of his hospitality could begrudge him the tribute? He was a great raconteur; a great story teller. Some of the best of his tales were of the days when he practiced on the East Side, before he became a "so much."

When he was sixty, he was honored with a *Festschrift* and at seventy his many friends gave a dinner in his honor, filling the vast hall of the Waldorf. When he was dead, among the mourners that filled the Free Synagogue were men and women from every walk of life, Jew and Gentile, the wealthy and the poor, the famous and the unknown. They were there bound by the wish to pay tribute to a good man and a great physician.

Consultation Service

VAGUE ABDOMINAL PAIN AND LEUKOCYTOSIS

QUESTION: A male 40 years of age consulted me because of vague, generalized abdominal pain which developed insidiously and radiated directly through to the midlumbar vertebrae. Pain was aching, intermittent, lasting for an hour or two on the average once a day for one month, and nothing he could do would relieve it. There were no known precipitating factors and no relation to meals. There was no fever and no history of alcoholism. Physical examination was completely negative. Laboratory study showed normal 80 hemoglobin and 4,300,000 erythrocyte count, but there were 18,000 white blood cells with 80 per cent polymorphonuclears and no immaturity. Sedimentation rate (Westergren) was 8 mm. x-rays of the chest, blood pressure and pulse were normal. ECG, stomach, colon, gallbladder x-rays were negative. The roentgenologist said there was diverticulosis and some hypertrophic lipping of the lumbar vertebrae, particularly L3 and 4. Is the osteoarthritis sufficient cause of the symptoms? I can't explain the leukocytosis.

M. D.—Kansas

ANSWER: Osteoarthritis is not uncommon in the spine of patients this age or older. Granted he is slightly young for the more extensive type, people younger than he may be afflicted. The pain as described is not characteristic of osteoarthritis which is usually located primarily in the back, secondarily in other locations, but this is not a hard and fast rule. People with pain due to osteoarthritis find, as a rule, that work and physical labor aggravate the symptoms, and that the pain tends to be worse after retiring and not affected by limbering up. The pain and stiffness of rheumatoid arthritis on the other hand is worse upon rising in the morning or after sitting in one position for a long time, and is eased by exercise or moving about. Of the two main types of arthritis, osteoarthritis and rheumatoid, the findings are consistent only with the former. Rheumatoid spondylitis is usually found in younger men and commonly shows X-ray changes in the sacroiliac joints. The sedimentation rate speaks for quiescent or absent infection, but the definite leukocytosis is as indicated and unexplained.

The lumbar spine x-rays (a-p and lateral) of many older people without back pain reveal hypertrophic osteoarthritis which is called an incidental finding, while the same roentgenologic picture in the presence of pain is generally considered evidence of cause. The doctor is thereby relieved to find a place to hang his diagnostic hat. A famous doctor, once called upon to explain the mechanism of the pain of osteoarthritis, said that at a meeting some years ago he had been called upon to explain this very phenomena after having a few cocktails before the meeting. "I gave them a wonderfully complete explanation," he said, "but now I have forgotten it."

It would seem that osteoarthritis must be the last hatrack after we have eliminated the others; first because the clinical story, incomplete as it is, is not characteristic; and secondly, another diagnostic problem, perhaps more amenable to therapy, may be overlooked. The mild anemia is of little help.

The diagnosis of diverticulosis in adults is common and of itself of no clinical significance. The roentgenologist can usually ascertain the presence of diverticulitis, but not with 100 per cent accuracy. The story again does not suggest diverticulitis because while acute diverticulitis resembles "left-sided appendicitis," chronic diverticulitis may give a thick-walled, palpable abscess in the left side of the pelvis. Diverticulitis, common in the age group 40—60, usually gives a long, intermittent history; tenderness and pyrexia are common, and on x-ray, the bowel typically shows strictures. There is usu-

ally leukocytosis. Every case of diverticulitis has an inception. It is conceivable that this is the beginning of the disease, but not likely. Sigmoidoscopy would help resolve the problem.

X-ray examination of the small bowel is usually unsatisfactory, but lesions may occasionally be found. The pain in obstructive lesions is apt to be more colicky in type and associated with vomiting. Regional ileitis must be considered.

In chronic relapsing pancreatitis, the pain is usually more severe with a long history and associated with a steatorrhea. If the pain persists, an excretory urogram should be made. Perhaps it would give the answer immediately. Repeated urinalysis should be made at once if not already done. Therefore we are left to explain a leukocytosis of considerable magnitude, in the absence of evident infection and a normal sedimentation rate. The causes of leukocytosis are too manifold to mention, but if we can be certain that infection is ruled out (which is not certain from the information given but which we may assume for the sake of discussion), then the one disease which must be considered is leukemia of the aleukemic type. A sternal biopsy may reveal abnormal cells. If this is in reality the cause of the leukocytosis, possible retroperitoneal infiltration may be the cause of the pain. One would expect either a palpable spleen or lymph nodes or both. I presume no palpable nodes were found. Careful, repeated white blood cell counts and differential diagnosis may reveal immaturity at one time or another. The white count must be followed until normal. A neutrophilic leukocytosis follows sudden loss of blood. This is present frequently in persons suffering from malignant disease, especially of the gastrointestinal tract. It results from certain drugs and poisons including carbon monoxide, lead, turpentine, and castor oil. There is no evident purulent infection in this case which causes high counts. One must consider exposure to poisons or drugs as an important diagnostic point, especially lead. Without basophilic stippling, blue line on the gums, peripheral neuritis, the test for lead in the urine would probably rule this out. The absence of anemia and rapid sedimentation rate are against multiple myeloma.

And finally, one must remember that while any doctor can diagnose about 85 per cent of cases, no one can diagnose many of the remaining 15 per cent. True, a few can be tracked down, but there is always a group in which no diagnosis can be made with certainty. Many of these develop a full-blown disease later; many recover and always remain obscure; the others go on with the symptoms either unsatisfied because their doctor has told them he does not know what the problem is, or satisfied with "colitis," "chronic appendicitis," "arthritis," "neuritis," and the others. In this case it is barely conceivable that all of the symptoms are due to osteoarthritis but why the leucocytosis? If further study fails to throw any more light on the problem, it is best to reserve judgment and study the case again in another month or two. A case of periarteritis nodosa, lupus erythematosis, dermatomyositis, may be lurking. It is my opinion that we cannot arrive at a diagnosis without more data or the lapse of more time. I would favor leukemia, carcinoma of the bowel, small intestine and periarteritis nodosa as the most likely in the order named.

Editor's Note: At an exploratory laparotomy subsequently performed, carcinoma of the cecum with metastases to the retroperitoneal lymph nodes was found.

MASSIVE VOMITING OF BLOOD

QUESTION: A patient 60 years of age first vomited about one quart of fresh red blood three months ago. There was no pain and, aside from the weakness which ensued, no subsequent symptoms until a second hematemesis one month later. This was followed by a third and a fourth, each of large quantity. X-ray studies elsewhere failed to reveal any lesion in the upper gastrointestinal tract. The patient sought a different medical consultant who ordered another barium x-ray which was interpreted as showing extensive carcinoma of the entire stomach. On this basis he was told he had cancer and that surgery was not advised. There was no rectal shelf, but a smooth large liver and spleen were palpable, and there was slight dependent edema. He had had an hemorrhoidectomy

four months ago. He is now under my care, and despite the loss of 25 pounds of weight, I am inclined to favor exploration. Under the circumstances, would surgery be justified?

M. D.—Missouri

ANSWER: This extremely interesting case presents several points concerning which there is room for justifiable difference of opinion, and in which there may have been committed serious errors. In the first place the patient was told he had cancer—I presume the word was used—when in fact this was not really known. The x-ray diagnosis of gastric lesions in good hands is remarkably high, but far from infallible. Thus, it seems that the *error of implicit belief in the x-ray* was committed, this, even if he actually has cancer, for without tissue examination or evidence of metastasis there is no proof. Massive hemorrhage of this type, although occurring in cancer of the stomach, is rare. Second, the *error of hidden historical facts* may have been committed, for although hemorrhoidectomy is a common operation, and though dependent edema is not uncommon in a man 60 years old, particularly after loss of blood proteins, nevertheless, these two, together with this history of emesis of bright red blood (not coffee ground) coupled with a palpable smooth liver and spleen suggest the possibility of bleeding esophageal varices on the basis of portal obstruction due to cirrhosis. Finally, there may have been committed the *error of failing to come to grips* with the problem. To this end a third gastric X-ray, or gastroscopy might solve the problem, or, as you suggest, surgery. If this is cancer, and if the entire stomach or a considerable portion thereof is involved, and there has been hesitation for several months, it seems unlikely that successful resection could be undertaken.

There are probably distant metastases. Nevertheless, the remote possibility of no metastases does exist, and if a repeated chest x-ray is negative, the liver still smooth, and no palpable nodes or rectal shelf, surgery might be undertaken. If the case is one of Banti's disease, the spleen should be removed.

The question always comes up as to whether the patient should be told he has cancer, and although there are many opinions on the subject, it is the writer's strong feeling that a patient should be told he has a "tumor," his relatives told that he has cancer. If the patient asks point blank, "Is this cancer?" the doctor is obligated to reply in the affirmative, if it is his absolute opinion that such is the case. In the absence of proof, he must say that such is his opinion. Can the patient be urged to submit to surgery? The answer is probably no. He can only be informed of the risks and the possible advantage.

BLEACHING OF HAIR

QUESTION: A patient of mine is in the habit of bleaching her hair periodically with a mixture of hydrogen peroxide (20 vol) and ammonia (about 2 parts to 1 part). She has been informed by a hairdresser that this will eventually destroy the hair roots. Is this true? If not, is there any danger?

M. D.—Louisiana

ANSWER: According to Savill, hair bleach, as well as hair dye, discourages the growth of hair. Repeated bleaching renders the hair fragile, producing crinkly hair which frequently breaks in many places when combed. There is no evidence, however, that there is permanent alteration of the hair follicle as the result of repeated bleaching with the mixture of hydrogen peroxide and ammonia.

REMOVING TATTOO MARKS

QUESTION: What is the best way to remove tattoo marks?

M. D.—California

ANSWER: There are three approaches to the removal of tattoo marks: surgical, electrolytic, and chemical. Surgical excision with or without a graft is most effective, depending, of course, on the size and location of the tattoo. Numerous other measures have been recommended, most of which result in scarring. The tattooed area can be re-tattooed with a 50 per cent solution of tannic acid, followed by the application of silver nitrate cream. The use of direct irritants or the removal of the pigmented particles with an eye curette has also been recommended. Direct irritation of the skin with 30 parts

of zinc chloride and 40 parts of water is of dubious value.

MULTIPLE WARTS

QUESTION: A schoolboy, apparently in perfect health, has a mass of warts on his hands and knees and they are now appearing on his lips and face. This is a distressing condition and I shall be grateful for advice. Cauterizing the warts individually would be an impossible task.

M. D.—Idaho

ANSWER: Superficial roentgen therapy is frequently of benefit for the removal of multiple warts. If this therapy is not effective, carbon dioxide snow as direct irritant to the warts is recommended. Mercury or arsenic by mouth is of definite value. A course of bismuth subsalicylate, 1 cc. intramuscularly once a week for twelve injections, is effective in about half of the patients.

REMOVAL OF SUPERFLUOUS HAIR

QUESTION: I remember seeing a preparation of barium recommended for safe and reliable method of removal of superfluous hair. Would you please say which barium salt is suitable for the purpose and give particulars of its application?

M. D.—South Dakota

ANSWER: Barium sulfide is a depilatory for removing the hair without affecting the papilla. There is a regrowth of hair, however, in approximately two to four weeks. The prescription for the use of this is: Rx. Barium sulfide 8; pulverized zinc oxide and pulverized amyl, ea. 12. This should be mixed with warm water just before it is applied to the face as a paste. A spatula should be used to spread this mixture to the hairy surface where it remains for approximately five to ten minutes. It is then scraped off and the face should be washed with warm water and cold cream applied.

The Bettmann Archive

Historical Epochs In Medicine: Professor Charles McBurney (1845-1931), famous for his discovery of the "McBurney point" as a sign for operative intervention in appendicitis, operating in Roosevelt Hospital, New York.

What Other Editors Think

Editorial Evaluations of Current Contributions to Medical Progress

MASKING OF SYPHILIS BY PENICILLIN

MUCH emphasis has been placed on the possibility of penicillin therapy in gonorrhea altering or masking the customary development and the signs of a syphilitic infection acquired with or prior to the gonococcal infection. That this is not without reason is supported by the accumulating experiences of many who engage in the treatment of large numbers of patients suffering from venereal diseases.

In the patient treated for gonorrhea with penicillin, a syphilitic infection acquired either before, at the time of the gonnorrheal infection, or later, may or may not be appreciably delayed in development, and then pursue a usual course with the formation of a chancre; or without the appearance of a chancre may be evidenced by the presence of generalized lymphadenopathy, or clinical manifestations of secondary syphilis or by a positive blood test. It follows then that any patient treated for gonorrhea with penicillin must be strongly warned to submit himself, at the least, for monthly blood tests for four months after receiving the drug.

Treatment of early syphilis with penicillin is accompanied by a Herxheimer reaction in about 90 per cent of all cases, while treatment of gonorrhea is rarely accompanied by fever. For example, in one series of 2,000 penicillin treated cases of gonorrhea, which did not present evidence of syphilis, only three patients were observed to have a febrile reaction which could not be explained on the basis of a toxic reaction to the penicillin or to the coexistence of syphilis. All of this strongly suggests that the occurrence of fever with penicillin treatment of gonorrhea indicates the coexistence of syphilis.

The foregoing discussion supports the admonition that penicillin treated patients be kept under strict clinical and serological supervision during the suggested four months observation period.

Macnish—The Urologic and Cutaneous Review, Vol. 50, P. 580

LEUKOCYTIC COUNT IN INFECTIOUS HEPATITIS

HAVENS and Marck have had the unique opportunity of observing a series of patients who had experimentally induced infectious hepatitis. These subjects were healthy male human volunteers whose age varied between 19 to 29 years. In addition to their observation on the course of the disease, the symptoms that the patients presented, and the other findings more or less characteristic in infectious hepatitis including jaundice, they made serial observations on the leukocytic response during the incubation period of the disease and its course. It is the response of the white cells to the virus that we wish to comment upon because the leukocytic count is of value in the diagnosis of this interesting disease which has become so frequent during the war period when large groups of young people were collected together.

Twenty-six patients are reported upon in detail. It is to be noted that the leukocytic response begins in the first twenty-four to forty-eight hours of fever and it is associated with the febrile pre-icteric phase of the disease. There develops early a leukopenia, a leukopenia which involves both the neutrophils and the lymphocytes. The charts of these observers show that there is a sharp drop in the total count which may fall as low as 2,000.

The average count is approximately 4,000. With

the development of jaundice the count rises gradually to a level between 6,000 and 7,000. The return to normal leukocytic relationship occurs by the end of the second week after the fever has appeared. There are exceptions of course and counts as high as 11,000 may be observed but, as noted before, the average count at time of the fever when the diagnosis is in abeyance because jaundice has not yet appeared, is low.

It should be noted further that there often appears a relative lymphocytosis with numerous atypical lymphocytes. The monocytes are sharply depressed while there is fever. The abnormal lymphocytes producing a relative lymphocytosis are often of the large type so that large lymphocytes may form in as many as 40 to 70 per cent of the total number. A few of these large cells are atypical in appearance so that their discovery may be of diagnostic importance.

Infectious hepatitis, now known definitely to be a virus disease, is sometimes difficult to recognize before the appearance of jaundice. A series of careful blood counts may be of some help in determining the febrile disease which a patient may have and of which the cause is unknown, prior to jaundice.

New Orleans Medical and Surgical Journal, Vol. 99, P. 182

CHOLESTEROL IN PROTECTION OF ARTERIAL LESIONS

OFTEN in research work it is wise to perform at the outset what appears to be a crazy experiment. For instance, years ago, chemists who were trying to find an organic compound in liver which would influence blood formation decided that they would go to the limit in the other direction and try the effect of some liver, ashed. To their astonishment they found that the ash did affect the formation of blood.

At the last meeting of the American Society for Experimental Pathology (Federation Proceedings, Vol. 5, February, 1946, pp. 223-224), Russell L. Holman of the Department of Pathology, School of Medicine, University of North Carolina, Chapel Hill, reported that in dogs with induced renal insufficiency he had been able, by changing the diet, to produce arterial lesions affecting primarily the inner layers of large arteries. The renal insufficiency was produced by toxins, such as uranium nitrate or mercuric chloride, or by bilateral nephrectomy. Some degree of renal damage was essential if the arterial lesions were to be produced. The injurious factor in the diet was found in concentrated form in commercial cod liver oil. It is heat stable, not readily oxidized, and is neither vitamin A, nor vitamin D.

To Holman's astonishment he found that the giving of cholesterol would protect against the formation of the arterial lesions. If this should be confirmed by further studies, the fact may alter some present theories about the dietetic treatment of persons with atherosclerosis.

W. C. A.—Gastroenterology, Vol. 7, P. 575

VITAMINS AND VITALITY

LITTLE publicity has been given to the saga of Balto the dog-mascot to a dispensary on the Alaska highway. Balto, it seems, chewed his way into a supply carton and swallowed several hundred vitamin tablets. What happened to Balto? Nothing. He did not zoom over the tundra or chase away a pack of wolves. Nor did he burst from any internal explosion. To the dismay of the pharmaceutical industry, Balto remained quite the same after his vitamin orgy as before. This unintended experiment in the efficacy of vitamins was matched on a smaller and more realistic scale, earlier this year when Bransby and his colleagues (*British Medical Journal*, 1:193, February, 1946) published the result of a study of supplementary vitamin feedings to children. One group of children received a capsule containing an inert placebo. The other group received a capsule loaded with vitamin A, riboflavin, ascorbic acid, vitamin D and nicotinamide. The project was faithfully followed for a full year. The supplementary vitamin, according to these authors, "had no consistent effect on growth, strength, endurance, fatigue, clinical conditions, or absenteeism from school."

This does not mean that a clinical syndrome would not have resulted had the diets been deficient in vitamins. It does suggest, however, that

the available diets, even in contemporary Britain, have all the vitamins that the organism can utilize.

Journal Medical Society of New Jersey, Vol. 43, P. 487

CRITERIA OF IRREVERSIBLE SHOCK

In studies of shock in dogs, Wiggers and Ingraham, of the University of Chicago, have developed a technic for withdrawal of blood to maintain hypotension for a period of ninety minutes. Clotting of the withdrawn blood is prevented, and subsequently all of it is returned to the veins of the animal. The animal may thus conveniently be studied in the shock state.

Acidosis usually develops as the blood pressure falls, so continuous intravenous injections of alkalizing agents, either sodium lactate or sodium bicarbonate, were administered. It was soon observed that lactate did not successfully combat the acidosis, but bicarbonate was much more effective.

In the dogs which died in shock, acidosis prevailed. In those which recovered, bicarbonate had been administered through the shock period, so that acidosis did not develop. Development of acidosis with low carbon dioxide capacity was considered an indication of irreversible shock. Uncorrected acidosis may contribute to or hasten development of severe and irreversible shock. Administration of bicarbonate considerably reduced the mortality rate.

Criteria of irreversible shock are: spontaneous and the persistent decline of arterial blood pressure. A dog with persistent declining tendency of the blood pressure in shock rarely recovers. The passage of bloody feces after withdrawn blood has been restored was also an indication of irreversible shock. And a markedly fast post-reinfusion heart rate was an indication. A rise of heart rate of 150 or more per minute within five or ten minutes after reinfusion was ominous. Satisfactory post-reinfusion arterial blood pressure did not indicate that the animal would recover.

They attempted to produce irreversible shock in dogs by giving them large doses of histamine. The blood pressures could be reduced to 35 to 50 mm. of mercury and kept there for three hours and longer, during which time severe acidosis existed. But only a third of the animals developed irreversible shock. It was considered that the vasoconstriction which follows hemorrhage is important in development of shock. Vasoconstriction does not occur in histamine hypotension.

Southern Medical Journal, Vol. 30, P. 671

RIGHT HEART CATHETERIZATION

Inasmuch as advances in medical research are so frequently associated with the introduction of new techniques of investigation, the increasing use of right heart catheterization in cardiovascular studies is worthy of note.

In 1941 Cournand and Ranges described the technique in detail and since that time numbers of workers in America and overseas have published their experimental experiences with this means of investigation. Thus, in a Symposium on Cardiac Output of the American Physiological Society a year ago, Cournand was able to state that the method "has proved its safety in well over 1,200 cases, not only in ours but in the hands of a number of other investigators in England and in this country."

It is possible by his method to obtain mixed venous blood from the heart in order to have data necessary for the determination of cardiac output by the direct Fick principle. The catheter has also been passed through the right atrium and on into liver radicles or into the renal vein to obtain blood samples from these regions.

Problems studied include the effects of blood loss, posthemorrhagic fainting, shock, right heart failure, chronic anemia and digitalis upon cardiac output and right auricular pressure.

In a recent report the practical advantages of heart catheterization in the differential diagnosis of congenital heart disease are demonstrated. These workers placed the tip of the catheter in a variety of locations within the heart and pulmonary tree and by a study of the oxygen content of samples taken at different sites were able to chart the route taken by the blood in an abnormal heart more accurately than has heretofore been possible. The knowledge so gained is obviously of great importance as regards whether or not surgery is indicated.

Canadian Medical Association Journal, Vol. 55, P. 392

BENIGN STRICTURES OF THE BILE DUCT

STRICTURE of the common or hepatic bile duct most often follows clamping, ligation or excision of the duct during cholecystectomy. The common duct will not be injured if it is clearly seen. The first necessity is adequate exposure with accurate definition of the junction of the hepatic, cystic, and common ducts before anything is clamped or cut. If this rule is followed, most of the hazards are eliminated. Injury occurs with inadequate exposure, inflammation or impaction of stones that shorten the cystic duct, strong traction on the gall bladder that tents up the common duct, anatomic abnormalities that confuse the relations, and blind efforts to control bleeding.

If the surgeon discovers a damaged or severed common bile duct, it should be repaired immediately for it is never easier to do later. The two ends of a divided duct should be united by end-to-end anastomosis. If a T-tube is used, the vertical limb should not come out through the suture line but rather above or below it. A duct that has been crushed by a clamp should be allowed to heal over a tube. If it is badly macerated, the devitalized tissue may be excised and an end-to-end anastomosis done.

The end-result of an unrepaired common duct injury is biliary fistula or stricture with devastating sequelæ. Small strictures are not so serious for they may often be successfully treated by plastic repair or by excision and end-to-end anastomosis. The real problem concerns those who have extensive stricture or loss of the duct, often complicated by repeated, fruitless attempts at repair and usually associated with anemia, hypoproteinemia, infection, and liver damage. These may often tax the fortitude, patience and ingenuity of those who seek to repair them. No one method is applicable to all cases. In general, two methods of attack have been used; either anastomosis of the duct to the intestine or reconstruction of the duct. Of the former, anastomosis of the duct to the duodenum has been used most frequently but only 23 per cent have a successful end-result (Eliot.) The Roux Y type of choledochojejunostomy, popularized by Whipple, is a more physiological intestinal anastomosis since the antiperistaltic loop of jejunum prevents reflux of intestinal contents into the biliary tract.

It appears desirable, whenever possible, to restore the normal anatomical arrangement of the part for few surgical procedures improve on nature. For this reason, even with extensive loss or stricture, efforts should be made to reunite whatever remains of the duct. This union may be possible only with tension on the suture line which permits reformation of the stricture. To prevent stricture the duct should heal over a tube which holds it open during repair. Dissatisfaction with the tissue irritation and fibrosis caused by rubber led to the use of vitallium for this purpose. Vitallium was selected because of its lack of tissue reaction, its smooth surface which did not attract concretions and its high tensile strength which permitted a thin wall with maximum lumen. Tantalum also has these characteristics and is more malleable but it cannot be welded, so no anchoring flange can be attached to it. Plastics were discarded because most of them are tissue irritants. Vitallium tubes have the disadvantage of being so hard that they cannot be altered, at the time of operation, to meet the needs of every situation nor is it possible for them to be removed except by an operative procedure.

Recently, 226 cases of the use of vitallium tubes were collected from a group of surgeons and the results studied. The outcome was satisfactory in 80 per cent of the cases when the tube was used for the reconstruction of the duct. Plugging of the tube occurred in 11 per cent and was the commonest cause of failure. Plugging may be diminished by using bile salts postoperatively but metabolic changes and infection make it difficult to eliminate occlusion of the tube completely. Anastomosis of the duct to the duodenum over a vitallium tube gave 58 per cent satisfactory results. The tube passed into the intestine in 38 per cent of the cases. This sequela is to be expected for no amount of anchoring will prevent the loosening of the tube. The results of Whipple's Roux Y anastomosis are still better for it is a more physiological operation.

Herman Pearse—Surgery, Gynecology and Obstetrics, Vol. 83, P. 549

The 1946 Meeting

1946 Program appreciated by receptive and indefatigable audience.

The large Technical Exhibit was replete with new drugs, new instruments and new appliances.

Interstate Postgraduate Medical Association Notes

CLEVELAND ASSEMBLY

October 14 to 18 inclusive, 1946

THE thirty-first year of our postgraduate medical teaching enterprise found our Assembly adequately housed in the splendid Cleveland Public Auditorium. Earnest doctors came from all of the states in the Union as well as many from abroad. Pleasing indeed was the greatly increased attendance of Canadian physicians, who were notably absent from our 1944 meeting due to the war and to the Canadian foreign exchange restrictions. No less gratifying was the attendance from California—proportionately larger from the standpoint of registered physicians per state than any excepting Ohio, where the meeting was held.

The large Technical Exhibit was especially noteworthy, replete with new drugs, new appliances, and new instruments, many displayed for the first time since our last Assembly in 1944, when shortly thereafter, the war ban enjoined the holding of large gatherings. The demonstrators did their full share in answering endless questions, and they contributed vastly to the general educational offerings at the meeting.

One hundred seventy-eight leading drug, instrument, and appliance manufacturers occupied two hundred thirty booths, filling to overflowing the excellent Exhibit Hall, brilliantly lighted with the special illumination installed for our needs.

As always, each teaching session started "on the dot" as scheduled, and the varied program with up-to-date instruction given by nationally recognized leaders in their respective fields was appreciated by a receptive and indefatigable audience, as evidenced by their reactions, and later reiterated by a flood of commendatory letters.

One of the outstanding events of the meeting was the decision by the Board of Trustees to discontinue the issuance of the Proceedings in a single volume. It was determined that henceforth the clinics and the addresses given at the annual meetings would be published exclusively in the new official magazine of the Interstate Postgraduate Medical Association, *Postgraduate Medicine*.

On the third evening of the Assembly, instead of the usual night lecture courses, the annual dinner was held in the largest dining room in Cleveland. Nearly a thousand were seated, filling the room to capacity, and others who were unable to purchase dinner tickets came later to hear the remarkably interesting addresses.

The retiring president, Dr. Donald C. Balfour, Director of the Mayo Foundation for Medical Education and Research, Rochester, Minnesota, gave a beautifully illustrated lecture entitled, "An Outline of Medical History." It was a delightful, comprehensive summary of the halting progress of medicine through the ages, and depicted the groping and the uncertainties—until about fifty years ago when with explosive suddenness, and chiefly through the displacement of empiricism by the ascendancy of research, the scientific tempo began to race. The development of the specialty fields and the incredible advances made, resulting in ever better and more dependable methods of diagnosis and treatment, from the combined efforts of scientists and artisans in all lines, has placed America far in the lead, and occasions constant wonder at the startling new developments in medicine which lie ahead.

The address by Colonel Ashley W. Oughterson, Medical and Scientific Director of the American Cancer Society, Inc., New York City, was a gripping, illustrated discourse concerning his investigations at Hiroshima and Nagasaki, of the effects of the Atomic Bomb, notably on humans in Japan. The unbelievably intense effects of the heat, of the blast, and more especially of the wide lethal radiation of devastating long-lasting electronic elements, were revealed by numerous slides which portrayed with an unforgettable vividness the horrors of atomic energy when employed as a destructive agent.

The brief acceptance address of Dr. James E. Paullin, Professor of Clinical Medicine, Emory University School of Medicine, Atlanta, Georgia, who succeeded President Balfour at this meeting, was gracious and humorous. President Paullin paid tribute to the past accomplishments of the Interstate Postgraduate Medical Association, and indicated he would lend his hearty support to

further progress. It was recalled by many at the dinner, that Dr. Paullin risked his life in a terrific emergency automobile drive of seventy miles when he was hurriedly summoned to Warm Springs, Georgia, the day President Franklin D. Roosevelt was stricken, and arrived just before President Roosevelt died. As the large audience departed at the conclusion of the dinner meeting, the general comment was that it was an occasion which long would be remembered.

The concluding day of the meeting found no diminution in the enthusiastic attendance. The fine clinics and addresses were attentively and appreciatively received despite the telling strain from absorbing information the preceding three days and nights. Late Friday afternoon, October 18, the session concluded with a remarkable address by Dr. Claude S. Beck, Professor of Neurosurgery, Western Reserve University School of Medicine, Cleveland, Ohio, on "New Developments in Surgery of the Heart." It was a fitting climax to an intensive program which gave the most of the best for the least. The management officers, the Board of Trustees, who had been hard at work all week guarding the success of the meeting, heaved a sigh of relief that all had been accomplished as scheduled, and joined the departing throng of doctors, enroute home to resume their practices, enriched in the more dependable methods of diagnosis and treatment. A. G. S.

NEW OFFICERS

INSTALLED as president of the Interstate Postgraduate Medical Association of North America graduate Medical Association of North America to serve until October, 1947, was Dr. James E. Paullin of Atlanta, Georgia. Dr. Paullin assumed his office at the Cleveland Assembly in October. At that time, Dr. Herman L. Kretschmer, Chicago, Ill., was elected president-elect of the Association for 1946-47.

Other officers elected are: Dr. John F. Erdmann, New York, N. Y., and Dr. Frank H. Lahey, Boston, Mass., presidents of clinics; Dr. Arthur G. Sullivan, Madison, Wis., managing director; Dr. Tom B. Throckmorton, Des Moines, Iowa, secretary; Dr. Henry G. Langworthy, Dubuque, Iowa, treasurer and director of foundation fund; Dr. Mather Pfeiffenberger, Alton, Ill., speaker of the assembly.

Members of the Board of Trustees are: Dr. Edwin S. Hamilton, Kankakee, Ill., Dr. Mather Pfeiffenberger, Alton, Ill., Dr. Maurice R. Williamson, Alton, Ill., Dr. Henry G. Langworthy, Dubuque, Ia., Dr. John E. O'Keefe, Waterloo, Ia., Dr. Tom B. Throckmorton, Des Moines, Ia., Dr. George V. I. Brown, Milwaukee, Wis., Dr. John M. Dodd, Ashland, Wis., and Dr. Eugene S. Sullivan, Madison, Wis.

The next Assembly of the Association will be held in the Public Auditorium at St. Louis, Mo., Tuesday to Friday inclusive, October 14 to 17, 1947.

MEDICAL EFFECTS OF ATOMIC BOMB

HIGHLIGHTING the dinner meeting of the International Medical Assembly of IPMA Thursday evening, October 17, 1946, was an illustrated address on "Medical Effects of the Atomic Bomb on Japan," by Colonel Ashley W. Oughterson. Colonel Oughterson is now Medical and Scientific Director of the American Cancer Society, Inc., in New York City.

Colonel Oughterson's address was preceded by the opening remarks of Dr. Russell B. Crawford, toastmaster and general chairman of the 1946 Cleveland Assembly of the Association, and by brief talks presented by Dr. Donald C. Balfour, retiring president, and Dr. James E. Paullin, president-elect of IPMA.

Dr. Crawford welcomed members of the Assembly and guests to Cleveland, saying: "The Academy of Medicine of Cleveland is pleased to be host once more to the Interstate Postgraduate Medical Association. I believe this is the third time that the Assembly has been in Cleveland. We in Cleveland have a very hearty respect for the Interstate meeting, feeling that it is the yearly accounting of the progress of medicine.

"It was my pleasure and privilege to attend one of the early meetings of this Association back in the early twenties in Des Moines, Iowa. I have a very vivid recollection of that meeting and a stage full of diabetic children that Dr. Joslin used in his clinic and with whom he was struggling to find the balance between sugar tolerance and sufficient nourishment to keep those children alive and let them grow. He little knew that just over the horizon in the test tubes of Banting and Best was the answer to his problem. That was only the begin-

ning of a quarter century of medical progress which probably has no counterpart in history.

"In addition to the Academy of Medicine welcoming you to Cleveland, Mr. Burke, the honorable mayor of the City of Cleveland, asked me to give you the official welcome of the City of Cleveland."

Dr. Crawford then introduced the retiring president, Dr. Balfour, professor of surgery at the Graduate School of Medicine, University of Minnesota, and Director of the Mayo Foundation for Medical Education and Research at Rochester, Minnesota. He spoke as follows:

"I feel it a great privilege and honor to be presiding here this evening. When you look back over the history of this organization, some 31 years, those of you who have been as loyal as most of you are to the organization will know what I mean when I say that I do not know of any organization which has kept the panorama of medicine so clearly before those who attend the sessions.

"To preside at this particular meeting is an unusual honor and privilege, because a great deal has accumulated since the last meeting in the way of knowledge, and the dissemination of that knowledge by the speakers who have been on this program has been something which I am sure you will all remember. For that reason, I should like at this moment to express to the Board of Trustees and to the local committee, of which Dr. Russell B. Crawford is chairman, and to Dr. Charles S. Higley, chairman of clinics, the very grateful thanks of you all for the magnificent program which they have put on for you."

JAMES E. PAULLIN, 1947 PRESIDENT

Dr. Paullin, president-elect of IPMA who was introduced by Dr. Balfour, said:

"It is with a great deal of humility that I enter upon the arduous duties of this office. For a poor, humble internist to follow such distinguished men as Frank Lahey, Fred Rankin and Donald Balfour, is an honor greatly appreciated by the humble ranks of your profession.

"I am very happy to head an organization such as this because it represents to me one of the greatest groups of physicians that we have assembled together—men and women who are associated in the general practice of medicine, people who take care of the sick. It is wonderful on occasions such as this to have this group together and to have brought to them the greatest developments in the various specialties, because these men—you and I and a lot of others—go back home to put into practice the things that we have learned here.

"There is not any greater field in medicine than that of education. I have been vitally interested in that for 40-odd years, having been an instructor, a teacher, a professor in medicine at Emory University in Atlanta. There is not any greater contribution that a man can make to his profession than in education, for in education he not only imparts knowledge but he himself becomes a better practitioner of medicine because he learns. If at any time in the course of a doctor's career he ceases to learn or to become instructed, somebody ought to take him out and give him some of Crawford W. Long's ether anesthesia.

"It is a wonderful occasion to meet with friends whom we have known for years and to welcome back into these meetings men who have given their service to their country during these past few years. No one knows better than I of the sacrifices which these men have made. I have seen them in the Army, I have seen them in the Navy, I have seen them in the Atlantic, I have seen them in the Pacific, I have seen them in our own country. No one can ever write a tribute to the members of the medical profession who entered World War II and who accomplished such brilliant results, no one can ever write a eulogy which will be equal to their attainments. They have not received the recognition that they should have had. We know that, I know it, you know it; but they have the consciousness of having done a job, of having done it well.

"We are approaching a period in world history that is going to be quite romantic. I hope I shall be able to carry on the traditions of this Assembly along the lines which have been outlined before. I do hope that as a result of these meetings and the thoughts that you carry back home, the reports that you make of what has been said here to your county and local medical societies, the medical profession itself will be elevated constantly to that tradition which we all hold close, of becoming better doctors, taking better care of our patients, and rendering to them a service which is unexcelled."

The Doctor in Literature

It is true that the professions of theology and law have contributed more to literature than has medicine, but in spite of this we like to think Chisholm was wrong when he said, "So few are those who have entered literature through the gateway of medicine, that it seems almost as if Apollo had disinherited his son Esculapius." However, even a casual search reveals a wealth of material, and we find that physicians from the time of Hippocrates have contributed a considerable amount.

* * *

The Hippocratic Oath is one of the world's finest pieces of prose writing, besides being one of the greatest of moral concepts. Shortly after the time of Christ, St. Luke, the great Hebrew physician of the New Testament, wrote the gospel which bears his name. He wrote with such a clear and scholarly pen that he justly ranks as one of the better writers of the world.

As we look into the literature of the various modern countries for contributions from medical men, we find Francois Rabelais, the French humorist, and Clemenceau, the author and statesman. In Russia, A. R. Chekov published plays and short stories, and in Germany Schiller and Goethe are best known. British names are legion—*Religio Medici* is probably the best known work of the classical scholar Thomas Browne. An early seventeenth century contemporary of his was Abraham Cowley, who wrote the poem, *Pyramus and Thisbe* at the age of nine. Scanning the long list we might pick out such outstanding men as Oliver Goldsmith, John Keats, Thomas Henry Huxley, William Osler, A. Conan Doyle, and Charles Scott Sherrington.

American physicians are entitled to their share of contributions to literature. Pennsylvania gave us Benjamin Rush and S. Weir Mitchell. An idea of Dr. Mitchell's virility of mind, at an advanced age, may be obtained

by recalling that he wrote *Westways,* a successful novel of buoyant youth, when he was eighty-four years old. Massachusetts' Oliver Wendell Holmes, who gave to medical science the first real conception of puerperal fever was, in literature, a master of two media—poetry and prose.

New York's Joseph Collins, professor of neurology in the New York Postgraduate Medical School, was well known as a literary critic. He made some studies of medical men in literature (*The Doctor Looks at Literature*) which are still admired.

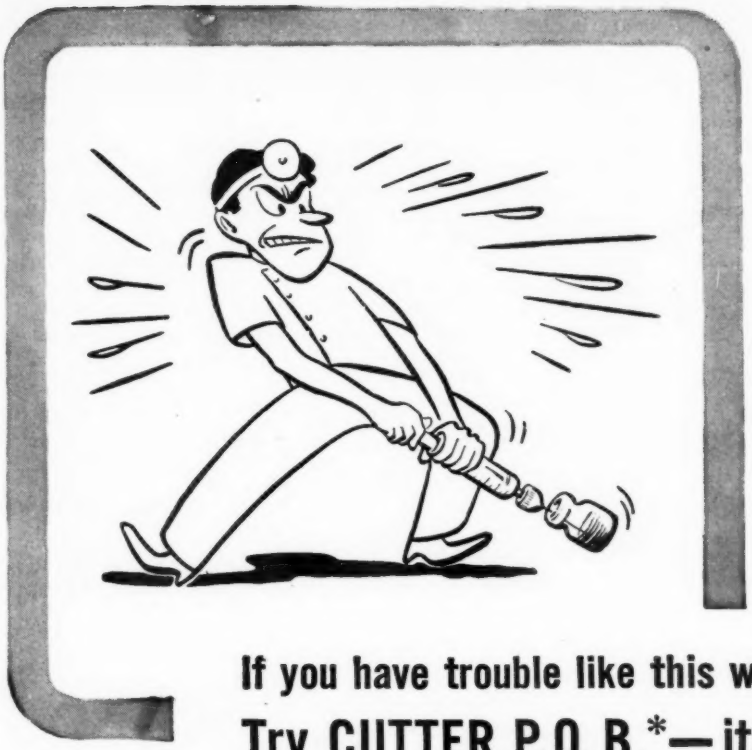
In the history of American letters, few men have had a Boswell equal to Harvard's Hans Zinsser, whose deep learning and salty wit made a book of the story of typhus fever, *Rats, Lice and History*. The influence of his work and writing swell into tidal waves which sweep the shores of medical thought. Before he died he wrote his autobiography, *As I Remember Him,* a remarkable book which is, indeed, a legacy to this generation from a great doctor.

Harvey Cushing, eminent as a surgeon, won a Pulitzer Prize for his *Life of Sir William Osler*; he now has the spotlight turned on him. Charles C. Thomas recently published a biography of Dr. Cushing—the man who wanted above all things to be a good doctor—written by Dr. John Fulton, Yale physiologist. As Dr. Cushing's literary executor, Dr. Fulton began this biography soon after Cushing's death, and writes with simplicity and deep understanding. It is an absorbing story of the growth of medical science through half a century, and a glowing tribute to the importance of "pure" science.

Both Holmes and Cushing liked to quote on occasion from *The Diary of The Rev. John Ward,* middle seventeenth century vicar of Stratford-on-Avon: "There are several sorts of Physitians, said one; first, those that canne talk but doe nothing; secondly, some that canne doe but not talk; thirdly some that can both doe and talk; fourthly, those that canne neither doe nor talk—but these get most monie."

* * *

Books are legacies which mankind delivers as presents to the posterity of those yet unborn. These babies just being born are going to grow up to read a lot of books about medicine and, of course, some of these will be written by doctors. "We'd like to have a nickel," report the editors of *Cosmopolitan,* "for every manuscript we've seen in the last six months that has been con-



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cerned with such things as palsy, alcoholism, psychoneurosis, diet, or atomic fission. The favorite theme of most writers today is medicine and, in particular, psychiatry." We are told by those in the trade that most story-tellers, even non-fiction writers, have dropped war themes.

Some years ago an article in *The Saturday Review of Literature,* noting the popularity of books about Lincoln, doctors, and dogs, suggested that an all-time best seller would be a book entitled *Lincoln's Doctor's Dog.* Judging by today's trend, it seems that someone has a chance to go a step further and top this by writing an extraordinary volume to be called *A Psychiatric Study of Lincoln's Doctor's Dog.*

* * *

Thoughts expressed in words are imperishable. Some of the words, however, are ever so hard to pronounce. According to Charles D. Rice, the editors of Webster's New International Dictionary, think they have discovered what may be the longest word in the dictionary. The word is a medical term meaning a lung disease that miners are liable to contract. Today it appears in the New Words Section, dragging its tail through a whole line of type. In case you are serious about this and want to settle a bet, here it is—a jawbreaker: *pneumonoultramicroscopicsilicovolcanokoniosis.*

POETRY: Browning said, "Unlock my heart with a sonnet-key." Either the weary, routine dullness or the very deep-felt excitement of medical duties give doctors a natural desire to write a sonnet or a ballad—to be lyrical and tuneful. With all the talk about relative merits of their poems, one must admit the doctors have not overlooked the entertainment principle. Yes, match the poem to the mood, of course, but also use the poem as a compensator, a means of covering up, neutralizing daily irritations—mesmerizing them out of apparent being. Even bad-poetry (doggerel) or, as Pope called it, "Prose run mad" is a gratifying pastime, for rhyme-making is fun.

The physician truly sees the poetry in life and often makes a stab at recording it. This is only natural, for as long as he lives and practices medicine, he has to face suffering, pain, disease, birth, and death. Boil this down and you find the physician covers every tendency discernible in life. The physician can and does become lyrical about what he knows, and in so doing he gives his work the vitality which is its fundamental excuse for being. The physician's mind comes to grips with concrete issues, and so he can contribute something toward the solution of the immediate problems of his period.

We can see it is no wonder at all that some physicians have the urge to put it down in verse and find it a pleasurable pastime and surcease from the cares and worries of the day. An Alabama physician, Dr. Samuel Minturn Peck, brings this thought out in the verse from his little volume *Cap and Bells*:

AMONG MY BOOKS

Among my books—what rest is there
From wasting woes! what balm for care!
If ills appall or clouds hang low
And drooping dim the fleeting show,
I revel still in visions rare.
At will I breathe the classic air,
The wanderings of Ulysses share;
Or see the plume of Bayard flow
Among my books.

* * *

Whatever face the world may wear—
If Lillian has no smile to spare,
For others let her beauty blow,
Such favors I can well forego;
Perchance forget the frowning fair
Among my books.

And reading his verse you can see that the good Doctor Peck isn't talking about medical technical books. As Carlyle said, "The true University these days is a collection of books;" and Disraeli said, "Volumes I prize above my dukedom."

Speaking of a play on words (and were we?), Thomas R. Henry, Science Editor of the Washington *Star* reports an extensive study of the physique of several hundred college girls conducted by the American Society of Physical Anthropology. The doctors have decided that girls have less physical stamina than men because their bodies are more likely to be out of balance. They used a scale which already had been applied to college men. The body was divided into five zones and each zone was classified for "soft-roundness," "muscular solidarity," and "delicacy." In men it had been found that,

when one zone rated high in one of these qualities, all the others were likely to rate high. For example, muscular solidarity of chest would probably be accompanied by muscular solidarity of legs and arms.

With the girls this was found much less likely to hold. Where as one part of the body might rate high in muscular solidarity, other parts might be characterized chiefly by soft roundness. In spite of this poor showing for girls, the two anthropologists called attention to the fact that normal young women show a considerable development of three muscles. One of these connects the head, neck, and shoulders, another is on the outer thigh, and a third is on the inner leg. The development of these muscles contributes to the distinctive appearance of the female outline!

* * *

And so, as we begin Anno Domini Nineteen Hundred and Forty Seven, we like to think it was O. Henry who said, "Life is made up of sobs, sniffles and smiles with sniffles predominating."

M. L. McD.

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